AUGUST, 1952

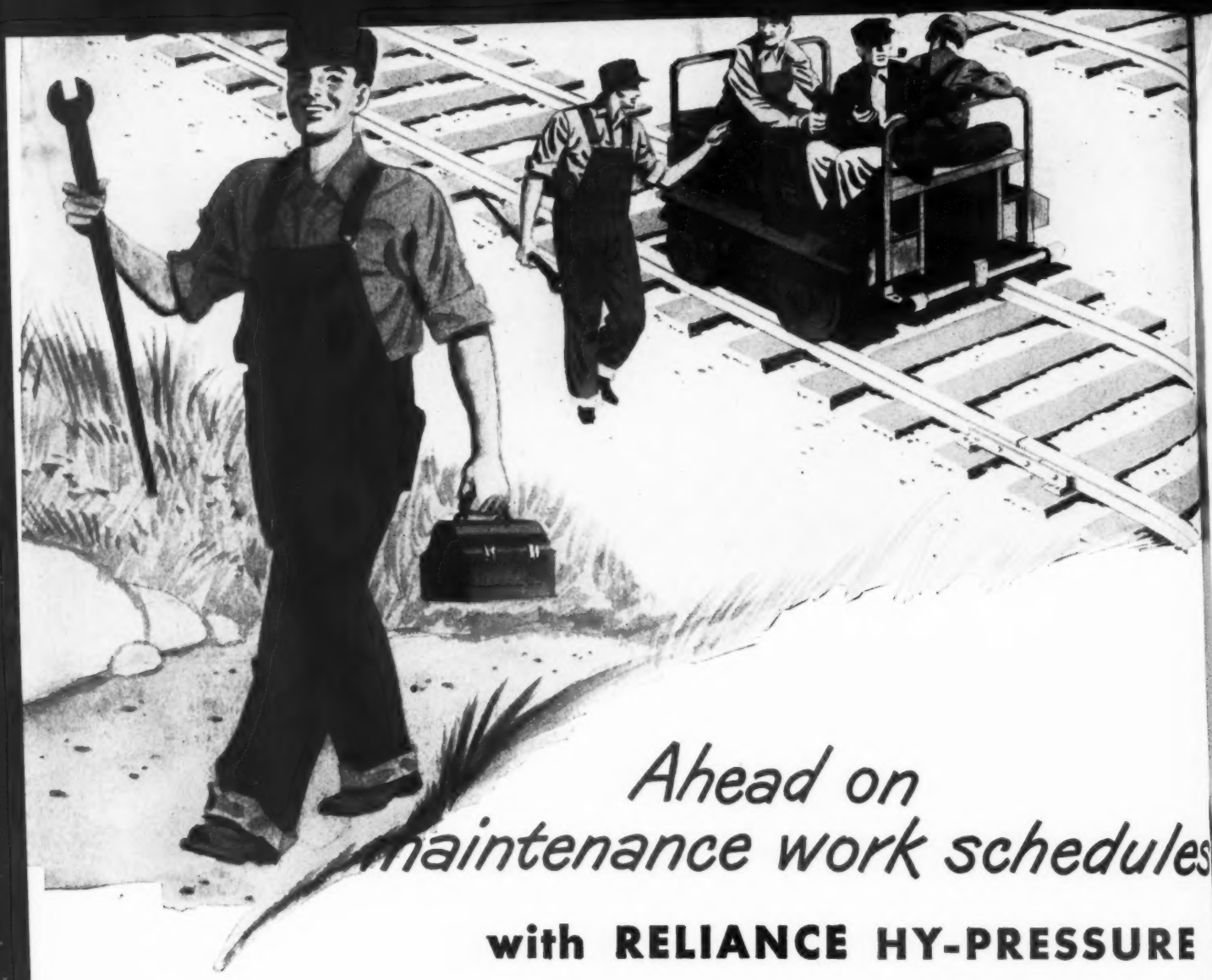
Railway Engineering and Maintenance

IMPROVED HIPOWERS
IMPROVE TRACK

These powerful spring washers improve track in several ways—their tremendous reserve power absorbs shocks and stresses, equalizing bolt tensions, insuring resilient joints and protecting rail ends.

THE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS



Ahead on maintenance work schedules

with RELIANCE HY-PRESSURE HY-CROME *spring washers*

MAN HOURS are reduced for maintenance crews working a section of track equipped with Reliance Hy-Pressure Hy-Crome spring washers. They are designed and manufactured to possess those inherent qualities necessary for keeping track joints tighter longer by providing continuous non-fatiguing calibrated reactive pressure with a wide reactive range. The special analysis alloy spring steel helps keep joint bolts under constant tension, automatically compensating for inevitable developed looseness as a result of wear in the bolted parts. Reliance Hy-Pressure Hy-Crome spring washers save railroads maintenance costs from the time of installation.

Our railway fastening engineers will give you complete details and provide highly interesting information about using Reliance Hy-Crome spring washers as time and money savers. A letter from you today will bring information without obligation.

"Edgemark of Quality"

EATON MANUFACTURING COMPANY, RELIANCE DIVISION

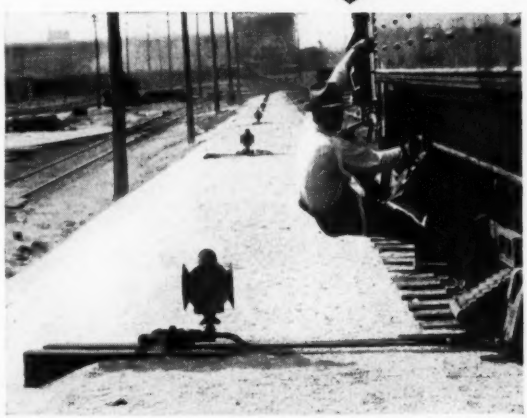
OFFICE AND PLANTS • MASSILLON, OHIO

SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS
SAN FRANCISCO • MONTREAL

Low... Safe... Easy to Throw

Bethlehem's 1222 is a low, streamlined switch stand that rises only a few inches above the ties. It's so compact that you'll find it especially useful in crowded yards or confined locations.

This same feature makes the 1222 one of the safest switch stands ever built. Because it hugs the ground, it isn't a hazard to overhanging loads (or overhanging trainmen . . . see picture!). Even with target or lamp, the 1222 keeps very much out of the way.



It's a powerful stand, too—designed for rails 60 lb and over. Yet it's easy to throw; has but three moving parts. The throwing lever actuates a sliding block, which instantly causes the crank to pivot. This simple mechanism builds up leverage quickly and transmits the necessary power.

While the 1222 is intended primarily for yard service, it can be used equally well in receiving and departure tracks. We'd like you to have complete details; phone or write the Bethlehem office nearest you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM MODEL 1222 SWITCH STAND

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, one year $2.00 (special rate to railroad employees only, one year $1.00). Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 48, No. 8.

Photo courtesy, Spray Services, Inc.

ESTERON BRUSH KILLER

Brush control along thousands of miles of roadbed is a big job—one that calls for the best brush-killing chemicals available. Two hard-hitting Dow products—Esteron* Brush Killer and Esteron 245—are first choice with spray service companies and railway maintenance men. Here's why these *proved* brush killers should be YOUR first consideration in a successful brush control program:

Both have given outstanding results in all sections of the country at all seasons of the year. Both contain highly effective, low-volatility esters. Esteron Brush Killer, a mixture of 2,4-D and 2,4,5-T esters, is widely used for control of mixed stands of brush and trees. Esteron 245, containing 2,4,5-T esters, is especially effective against poison ivy and other 2,4-D resistant species. This product also is recommended for year-around stump treatment and basal bark application. (Grass in ballast? Use Sodium TCA 90%.)

*Esteron is a registered trade mark of The Dow Chemical Company, largest producers of weed, brush and grass control chemicals.

Ask your supplier or write to Dow for literature on right-of-way vegetation control

THE DOW CHEMICAL COMPANY

Agricultural Chemical Deparment

MIDLAND, MICHIGAN

In Canada: Dow Chemical of Canada, Limited, Toronto, Canada

DOW

CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

For additional information, use postcard, pages 739-740

Maintains a right of way six ways on TIMKEN® bearings

THIS Fairmont ballast maintenance car can do many roadbed maintenance jobs. It can be fitted with six different work tools, namely: scarifiers, a ten-foot blader, a 76-inch blader, ballast equalizing boxes, discs or a center plow. It keeps on the go and requires little maintenance with 22 Timken® tapered roller bearings in the wheels, drive gears, speed reducers and transmission.

Tapered construction enables Timken bearings to take radial and thrust loads in any combination—line contact between rollers and races gives them load-carrying capacity to spare. Shafts are held in accurate alignment, end-play is minimized. Gears mesh smoothly, reducing wear.

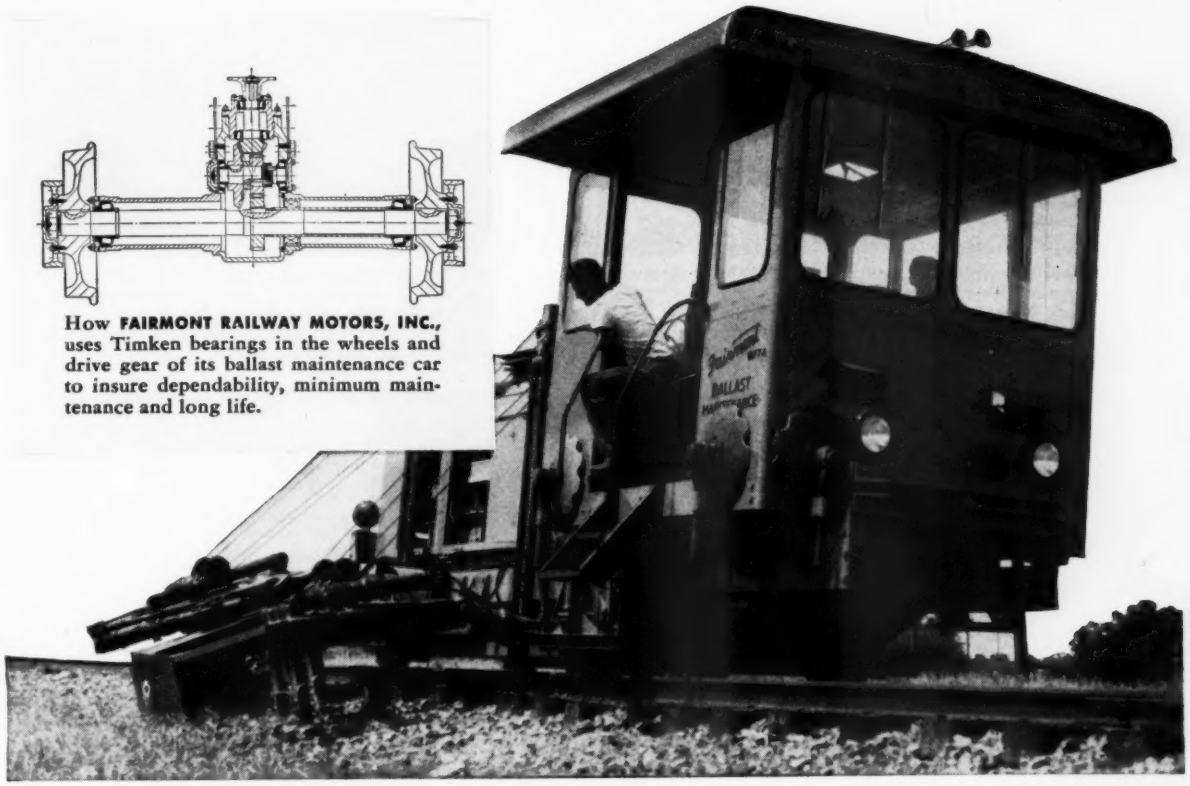
Since Timken bearings keep housings and shafts concentric, they make closures more effective. Dirt and moisture stay out—lubricant stays in. Maintenance and lubrication are minimized.

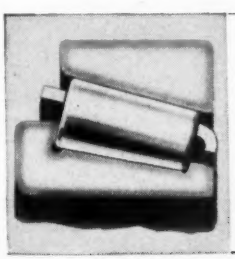
The true rolling motion and incredibly smooth finish of Timken bearings practically eliminate friction. Wear within the bearing itself is negligible. Costly break-downs are prevented.

No other bearing can give you all the advantages you get with Timken bearings. Make sure you have them in the equipment you buy or build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **FAIRMONT RAILWAY MOTORS, INC.,** uses Timken bearings in the wheels and drive gear of its ballast maintenance car to insure dependability, minimum maintenance and long life.





GREATER LOAD AREA

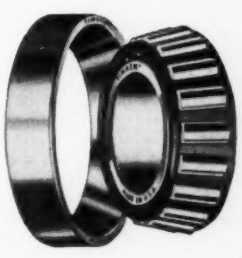
Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

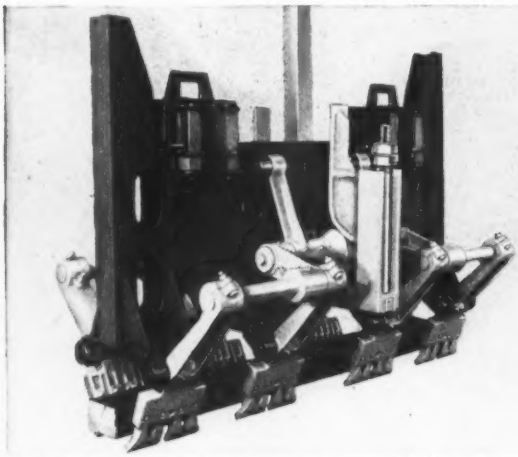
TRADE-MARK REG. U. S. PAT. OFF.

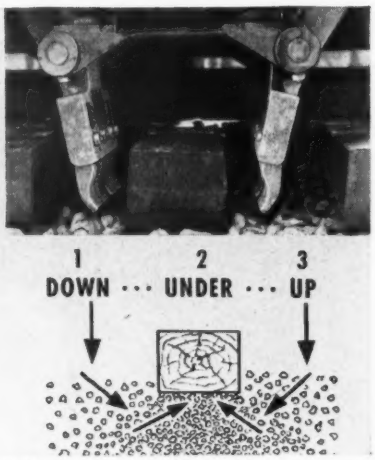
TAPERED ROLLER BEARINGS



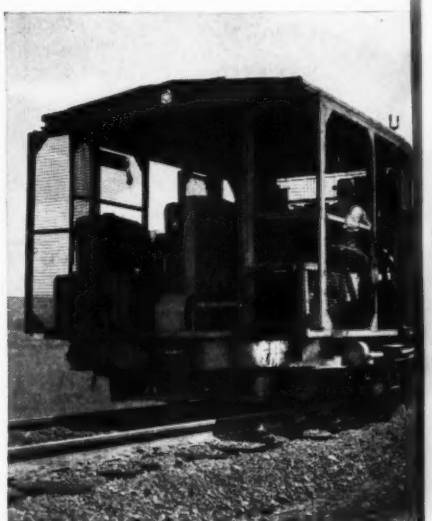
NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▱ BEARING TAKES RADIAL ◫ AND THRUST ⊣◫⊢ LOADS OR ANY COMBINATION ✳

Single track—requires speed, flexibility and reliability. The above illustration shows the self-propelled set-off operation of the Power Ballaster on the Denver & Rio Grande Western R. R., Moffatt Division, milepost 103, near Kremmling, Colorado. Maintenance work is done under traffic (8 to 10 train interruptions per trick)—on this single track railroad in the most mountainous terrain of the United States. The Power Ballaster is completely self-propelled; and has a set-off mechanism which enables four men to set the unit off laterally in 3 to 5 minutes. Delays due to train interruptions are thus reduced to a minimum. The Ballaster's high production rate makes maximum use of available track time.





Triple-Action Compaction is one secret of the Power Ballaster's ability to produce better, longer-lasting track. Left: The drop-head assembly applies tamping force equally to all tamping bars and delivers 36 complete tamping strokes a minute. A free-falling drop-head combined with cam action provides a tamping force which increases throughout the tamping stroke and tamping cycle, and produces maximum ballast compaction under the tie. A readily made adjustment regulates the depth reached by the Power Ballaster's controlled compaction—applies maximum tamping force exactly where wanted. Upper right: Because the Power Ballaster has 32 tamping bar positions and five different sizes of quickly interchangeable tamping bars, the Power Ballaster: (a) is a universal machine, (b) produces an under-tie-and-rail area of compaction fully meeting A.R.E.A. specifications, and by the methods specified by the A.R.E.A. Lower right: Diagram shows triple-action compaction.



High running speed—25 m.p.h.—of the Power Ballaster makes it possible to clear and get to and from work locations quickly. Its high production speed is especially important where work must be done under traffic and on single track. And its reliability assures mechanical trouble-free performance throughout the work season.

SUBSIDIARY OF

ROAD & TRACK EQUIPMENT DIVISION **PULLMAN**

Pullman-Standard POWER BALLASTER

Faster! Faster! Faster! The demand for speed and more speed is an ever-present challenge to railroad men and to the manufacturers of equipment. Mechanized tamping is no exception. The fact that the Power Ballaster meets this challenge, while tamping all types of ballast, is proved time and time again on many lines. But equally important, the Power Ballaster combines high speed production with low-cost, quality tamping. For example, the Power Ballaster purchased by the Rio Grande four years ago saved $70,000 in out-of-pocket cost the first year. And it goes right on making savings.

helped the Rio Grande

In addition to its speed and economy features, the Power Ballaster produces longer lasting track. A squared under-tie-and-rail compaction is obtained by the methods and to the specifications established by A.R.E.A. standards. The results: true cross-level tamping, uniform compaction, less settlement, *and longer track life.* The normal production rate is 500 to 700 feet per hour. Many exclusive labor-saving features reduce crew requirements to as few as 10 to 15 men. The Power Ballaster requires only a single operator, and because of the Power Ballaster's design, minor repairs and adjustments can be made by the operator at the work location. The Power Ballaster's 1951 availability rate was 96.6% of production time.

save $70,000 the first year

For more feet of finished tamped track per hour, for higher availability, for lower labor and maintenance requirements—the Power Ballaster's established record cannot be equaled by any production tamper available today.

And you can prove it while tamping your own ballast. Just choose one of these four ways: (1) outright purchase; (2) rental for 90 days, with option to buy (with all rental payments applied to purchase price); (3) straight rental for a minimum period of three months; (4) deferred quarterly payments over a period of 1 to 3 years. The rentals and deferred payments are established at substantially less than the realizable savings accruing during the payment periods.

MAIN LINE Rio Grande THRU THE ROCKIES

A leading financial newspaper has headlined the savings made by the Rio Grande. The article states that the savings are made through the use of "Mechanical Monsters which dig the stones from between the rails, brush the dirt off of them, and pack them back into place".

The records show, for example, that the Pullman-Standard Power Ballaster saved the Rio Grande $70,000 in out-of-pocket costs during the first year of its use. The Power Track Cribber, which was also pioneered by the Rio Grande, saved an additional $47,000 during its first year of operation.

In these ways, the Rio Grande, leader in the use of all types of mechanized track work equipment, including bulldozers, crawler-mounted drag lines and shovels, has materially lowered its maintenance of way costs in recent years, despite the rising costs of labor and materials.

Here's what YOU can expect from the POWER BALLASTER:

- Longer Lasting Track
- More Production
- Lower Labor Requirement
- Universal Application
- Maximum Use of Track Time
- Easy Operation and Maintenance
- Long Equipment Life
- Versatile Production

Your assurance: PULLMAN-STANDARD has been one of the great U. S. railroad equipment suppliers for 73 years; its time proven integrity and reliability are behind the POWER BALLASTER to protect your equipment investment and to assure a factory stand-by of spare parts and continuing factory service.

Write for booklet containing complete detailed engineering data and operating facts about the POWER BALLASTER. When you come to Chicago, visit our Michigan Avenue Industrial Showroom.

PULLMAN INC.

PULLMAN-STANDARD CAR MANUFACTURING COMPANY

45 TON CAPACITY

WORLD'S LARGEST RUBBER-TIRE CRANE

Here it is — the largest crane on rubber in the world — the Lorain MC824 Moto-Crane. This is one of two working for Ebasco Service Corp., Joppa, Illinois. A number of these giant cranes have been proven in all types of service — all over the country.

NEED A CRANE ON RUBBER?

LORAIN BUILDS THE MOST COMPLETE LINE

FROM 10 TO 45 TONS

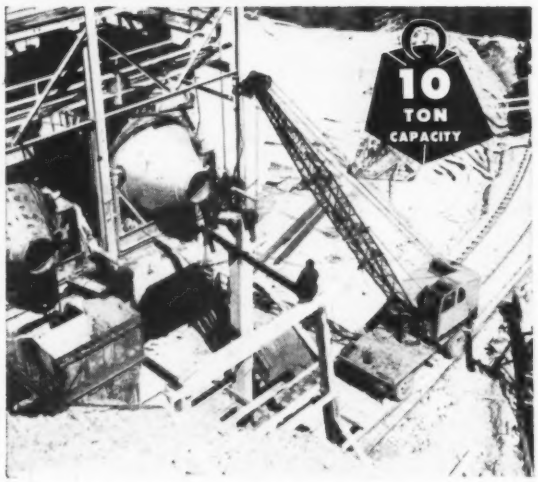
When your job calls for rubber-tire mobility in a crane, make your selection from the world's most complete line . . . LORAIN! You'll have more sizes, types of mountings and drive arrangements to fit your needs — no matter what they may be.

NEED CAPACITY? How big — or small — or in between? Lorain Crane capacities on rubber range from the versatile 10-ton Self-Propelled SP152 up to the world's largest crane on rubber — the mighty 45-ton MC824 Moto-Crane shown above.

NEED POWER & DRIVE? Select from 2 or 3 axle types with 4 or 6-wheel drive for plenty of tractive effort — plus big, multiple tires for soft ground flotation. There's a type to match your needs.

NEED 1 OR 2 ENGINES? 30 m.p.h. Moto-Cranes with 2 engines are especially Lorain engineered and built to match crane capacities. Single-engine, Self-Propelled machines (7 m.p.h.) round out the biggest rubber-tire crane selection in the field! Remember, Thew built the first crane on rubber tires and is still the leader in this field. *If you need a rubber-tire Crane . . . be sure to check with your Thew-Lorain Distributor to be sure of the best!*

THE THEW SHOVEL CO., LORAIN, OHIO



LORAIN BUILDS CRANES FOR THE SMALL JOBS, TOO! Here's the "baby" of the Lorain Rubber-Tire Crane family. This 10-ton Self-Propelled Crane, Model SP152, erects a concrete plant for dam construction. Big lifts or little, there's a Lorain on rubber to fit the job.

SEE YOUR LOCAL THEW LORAIN DISTRIBUTOR

THEW **LORAIN**®

SHOVELS • CRANES • CLAMSHELLS • DRAGLINES
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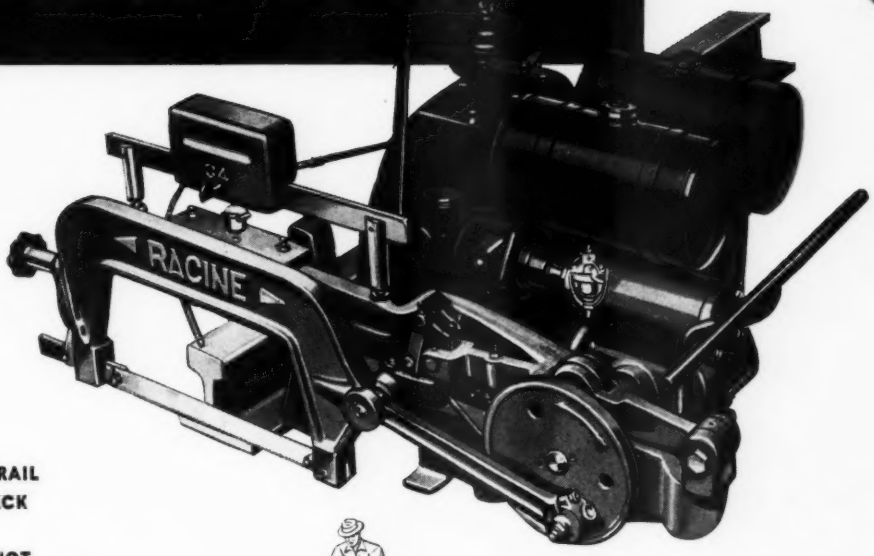
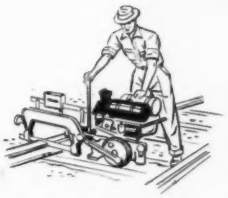
For additional information, use postcard, pages 739-740

YOUR EXTRA EMPLOYEE THAT WORKS WITHOUT PAY

RACINE *Portable* RAIL SAW



- CROP RAIL IN TRACK
- WILL NOT SHATTER OR BURN RAIL ENDS
- CUT OFF ANY LENGTH DOWN TO 1/10"
- NO TRAFFIC INTERFERENCE



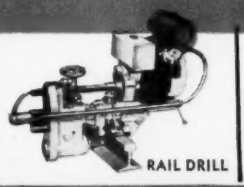
One man operates the RACINE Portable Rail Saw while it does the work of several hands. Designed specifically for cutting rail in track, it handles the job fast and dependably.

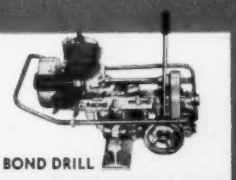
Cuts are smooth and accurate. Shattered and burned rail ends are eliminated. The possibility of rail failures from fractures that start with torch cutting or "nick and break" cropping is reduced.

Easily moved by two men, it does not hamper traffic. Operation is simple. Maintenance cost is low. Here is an "extra employee" you can rely upon for steady output under all conditions.

Write for new, 3-color catalog describing RACINE Railway Maintenance Machines.

OTHER RACINE PORTABLE MACHINES





RACINE HYDRAULICS & MACHINERY, INC.
2038 Albert Street • Racine, Wis.

Rain in the air means water on the rail . . . poor visibility and increased danger for all personnel. Rainy weather can also cause drive slippage on a motor car—*unless* it's equipped with a Fairbanks-Morse positive chain or vee-belt drive.

Positive drive . . . immediate reverse . . . four-wheel brakes . . . grouped controls . . . full visibility—*in all weather.* These are a few of the reasons why the Fairbanks-Morse Model 101 Motor car has won a reputation for safety—*in all weather.*

For all maintenance, inspection and signalling service, look to the complete line of Fairbanks-Morse cars. You'll find the answer to safe, reliable transportation. Fairbanks, Morse & Co.

FAIRBANKS-MORSE

a name worth remembering when you want the best

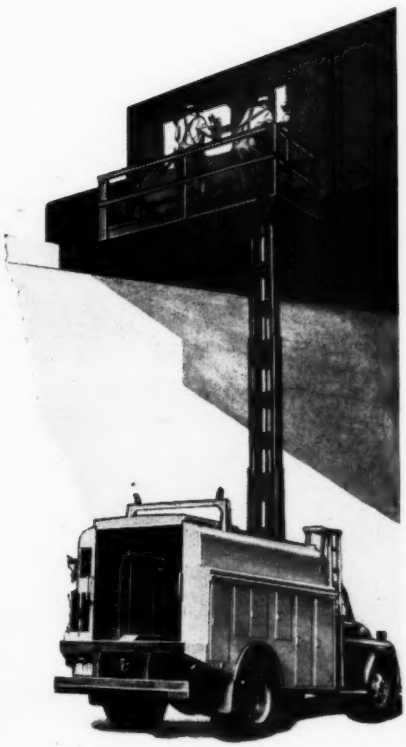
RAIL CARS • RAILROAD EQUIPMENT • PUMPS • SCALES • ELECTRICAL MACHINERY
DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • MAGNETOS

This Mark HOLAN

identifies the most efficient Utility Bodies you can use

The yearly savings, made possible by well designed utility bodies, is becoming more and more apparent to utility executives. That is why men in the industry are so enthusiastic about the many advanced features developed by Holan engineers.

Holan utility bodies can help you solve the problem of rising costs versus controlled rates. There is a complete line of Holan bodies for construction, maintenance and service work.



The platform on the Holan hydraulic tower can be raised to a height of 30 feet, lowered to approximately 10 feet, 3 inches. Operation is completely automatic.

Model CLC-138 Line Body with four man crew compartment. Many standard line body models are available, with or without crew compartments.

Model CS-90 Cable Splicer and Maintenance Body. Compartments carry furnace, solder pot, cylinders, tent carriers, platforms, testing equipment, rubber goods, wire, tools and small parts.

The dependable name in utility bodies

J. H. HOLAN CORPORATION

BODIES AND ACCESSORIES FOR UTILITIES
4100 West 150th Street — Cleveland 11, Ohio

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2401 Hutchinson Ave., Charlotte, N. C.

Schetky Equipment Corp.
1810 S. E. 10th Ave., Portland 14, Ore.

There Is No Electric Hand Tool that Can't Be Operated by a

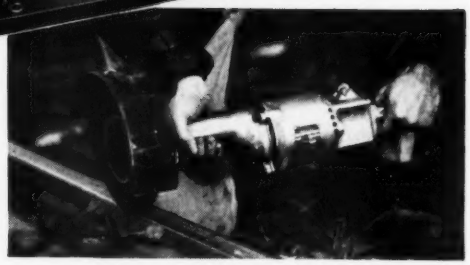
HOMELITE *Dual Purpose* GENERATOR

It makes no difference whether you're using high cycle or standard universal hand tools . . . a Homelite Dual Purpose Generator will give you the power to operate these tools.

That's right! The *one* generator provides power for both types of tools . . . *all* hand tools of *both* types. And what's more, it provides that double-duty, all-inclusive, instant power anywhere you want it . . . any place on your road.

It's portable . . . it's *carryable.* It can be rushed everywhere. Simply start it and you have the power to operate drills, grinders, hand saws, chain saws . . . all the tools that mean quick, low-cost maintenance.

Why not see it in operation? See what it can do for you. Write, today, for a free, complete demonstration.



Operates High Cycle Tools

Operates Standard Universal Tools

Operates Brilliant Flood Lights

Manufacturers of Homelite
Carryable Pumps • Generators
Blowers • Chain Saws

PERFORMANCE · DEPENDABILITY · SERVICE

HOMELITE
CORPORATION
208 RIVERDALE AVENUE • PORT CHESTER, N. Y.

For additional information, use postcard, pages 739-740

Off-track versatility

makes the *Pneumatractor* a great all-around maintenance work-saver

Here is the ideal air supply for an eight to ten tamper gang engaged either in spot or in out-of-face tamping. The *Pneumatractor* has all the obvious advantages of an off-track self-propelled compressor. Because it remains out of traffic's way, there is no time lost moving it off and on the rails. As work moves ahead, the *Pneumatractor* keeps abreast of it, pulling the hose manifold along as you go. Hook a trailer on behind and you can carry all the tools used by the gang—fork, etc. as well as the air tampers. And of course, its handy mobility—so ideally fitted for tie tamping—also increases its usefulness for other jobs, whether they be spike driving, spray painting, timber sawing, or many others.

Yet air jobs cover only one side of the *Pneumatractor's* usefulness. Because it is a powerful industrial tractor, it can push or pull anything a tractor can. And because it accommodates so many auxiliary attachments, it is adaptable to a host of specific jobs that usually require separate equipment. A few of these are sketched here. Some others are back hoe trenching, mowing and hoisting, to name just a few. Write for free copy of Bulletin RM-52.

SPECIFICATIONS. Air capacity, 105 cubic feet per minute, actual air at 100 p.s.i.

ENGINE AND COMPRESSOR. Unit type—three compressor and three power cylinders in the same block. Engine is 226 cu. in. displacement and develops 36 brake horsepower.

PNEUMASTAT CONTROL saves fuel, wear and tear by operating compressor at demand load.

OTHER SCHRAMM FEATURES: Positive cam-operated intake valves; efficient *Unistage* discharge valve; push-button starting and interchangeable parts.

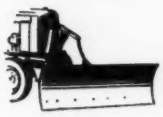
DIMENSIONS. Length 117 inches; width (varying with type of rear wheels) 62¾ to 91 inches. Available with six types of rear wheels; Standard or heavy wide and narrow and standard or heavy dual wheels. Weight (depending on wheel type) 3935 to 6385 pounds. Prices upon application.

DRIVING SHEETING

ROTARY BRUSH

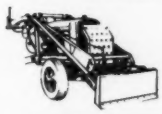
FRONT WINCH

FRONT END LOADER



SNOW PLOW

POST HOLE DIGGER



BACKFILL BLADE

ROCK DRILL

SPRAY PAINTING

SCHRAMM INC. *The Compressor People* **WEST CHESTER • PENNSYLVANIA**

Simplified construction in sight

...with MONOTUBE cold-rolled steel piles!

THE advantages afforded by Monotube piles in this major Canadian industrial project are well worth considering . . .

Although driving conditions were extremely tough—10 to 15 feet of heavy slag fill—over 3,000 Monotubes up to 80 feet long were driven with only light, mobile equipment!

Secondly, the job involves high loading . . . safely accomplished using fluted, cold-rolled Monotubes with 12″ butts and standard 8″ tips.

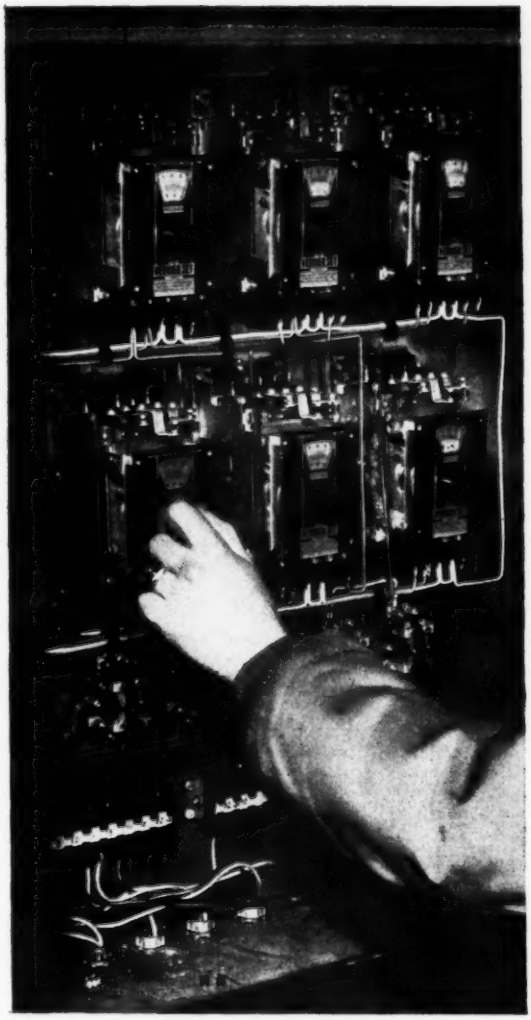
Finally, Monotubes as usual afforded the extra advantage of easy, on-the-job cutoff and extendibility. Cutoffs were readily re-used as extensions.

Monotubes come in types and sizes for sound, economical support in any kind of soil under *all* kinds of structures. For details write to The Union Metal Manufacturing Co., Canton 5, O.

UNION METAL

Monotube Foundation Piles

TO GET LENGTHENED RAIL LIFE...



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Electrically controlled automatic equipment operating in protective atmospheres insures the finest end-hardened rails obtainable.

eliminate HAPHAZARD PATTERNS

Uniform hardness patterns are the result of positive control throughout the process. From a maximum hardness of from 321 to 401 BHN at the rail head, the transition is gradual to normal rail hardness. This creates a tough, impact-resisting end structure.

eliminate ONE FIELD OPERATION

Rails can be laid as received . . . eliminating equipment and personnel required for field end-hardening . . . speeding completion of track laying.

You are invited to visit our Pueblo Rail Mill to inspect CF&I modern rail end-hardening facilities.

RAILS AND ACCESSORIES

THE COLORADO FUEL AND IRON CORPORATION CF&I

DENVER, COLORADO

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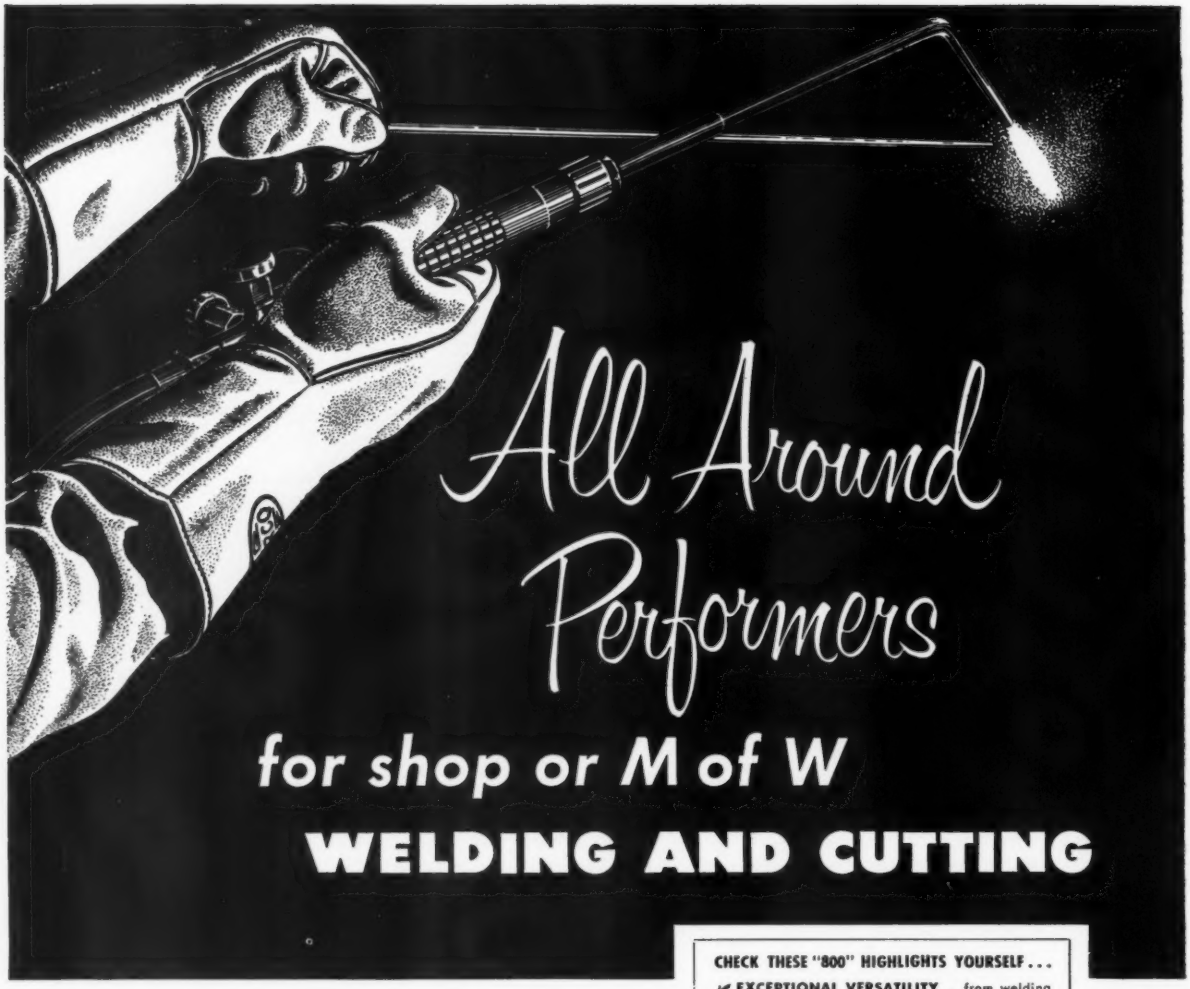

All Around Performers

for shop or M of W

WELDING AND CUTTING

CHECK THESE "800" HIGHLIGHTS YOURSELF...

- **EXCEPTIONAL VERSATILITY**...from welding and cutting to descaling and flame cleaning, hardening, and hardfacing.
- **WIDE TIP RANGE**...long flame or bulbous up to size 10. In separable swaged tips—up to size 13.
- **LOWER OPERATOR FATIGUE**...10 inches long; 21 ounce weight; planned balance minimizes operator fatigue.
- **FOR METAL CUTTING, TOO**...quickly converted for cutting either thin sheets or heavy plate up to 5-6" thick.

Ask for Catalog 2, Hand Torches for Welding and Cutting.

The Airco No. 800 Torch—with wider welding range than any other torch on the market—is ready for any job from car side sheets to main frames. Its weld-and-cut versatility makes it a natural for shop or along-the-track field work where a torch must withstand a lot of rough handling.

AND...the Airco 8400 series two-stage regulator...your guarantee of constant gas pressure. One pressure setting needs no further attention. Saves time, gas, with trouble-free operation—gives better flame performance in welding and cutting. Ask for Catalog 5, Regulators.

SUPPLIES, TOO...To complete the team for all around shop or maintenance-of-way welding, Airco offers a number of gas welding rods and electrodes, especially tailored for railroad service. You'll find them described in Catalog 12, Supplies. Ask for your copy today.

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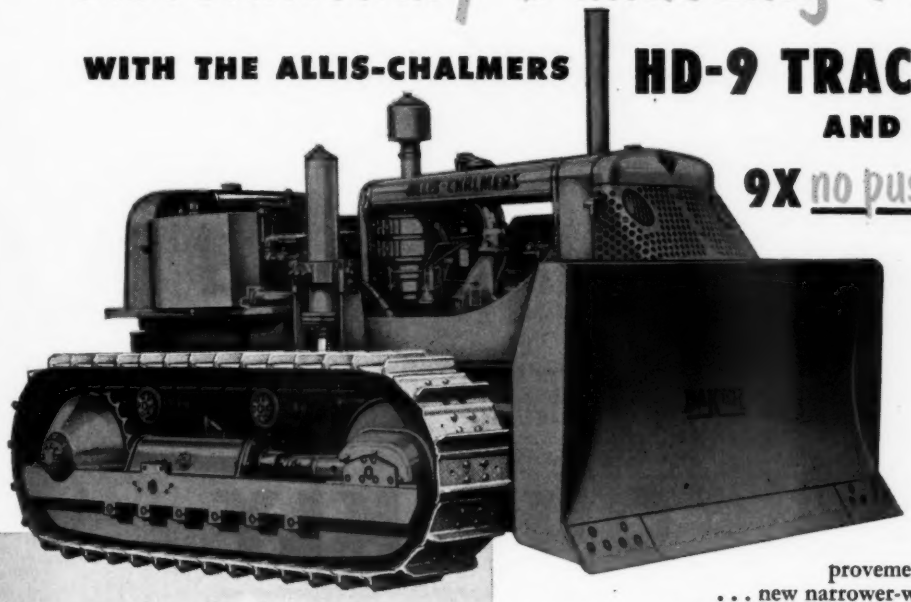
Now...

Revolutionary Bulldozing Performance

WITH THE ALLIS-CHALMERS HD-9 TRACTOR AND NEW BAKER 9X no push-beam DOZER



8-FT. HIGHWAY-WIDTH BLADE
No Transport Permit Needed

72 Drawbar Hp.
Weight with Dozer, 21,500 lb.
6 speeds forward, 3 reverse

This major bulldozer design improvement brings you new dirt-moving ability . . . new narrower-width blade for transporting by highway . . . new low original cost . . . new ease of servicing and operator comfort.

Here's what makes this team the most productive combination for railroad work:

A GREAT NEW TRACTOR. This new Allis-Chalmers HD-9 Tractor has power, weight and balance that puts it in a class by itself — never such traction . . . such pushing and pulling ability.

A REVOLUTIONARY TEAM. Here is a tractor-dozer combination designed together as a unit, which compares in performance with conventional "dozers" weighing from five to six thousand pounds more.

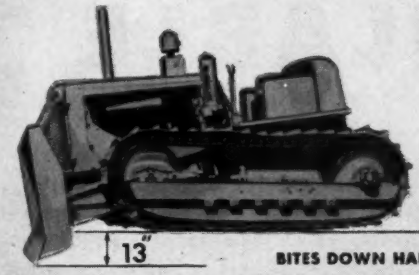
NO PUSH BEAMS. A completely new idea in bulldozer engineering, the 9X blade is mounted directly to the HD-9 main frame. Tractor main frame and dozer are raised and lowered as a single unit.

LIGHTER WEIGHT — BETTER STABILITY. Almost 1,150 lb. lighter than standard dozer. Costs less to buy. And with lighter blade mounted 15 inches closer, tractor center of gravity is not upset. No excess wear on front truck wheels and support rollers.

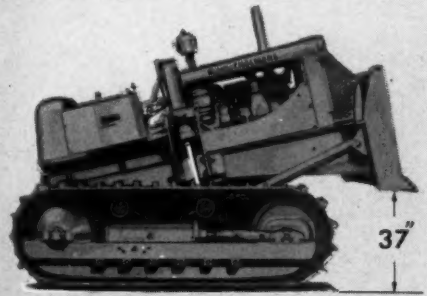
BIG DIRT MOVER. Because of extra clearance, greatly increased track oscillation and better balance, this team is a phenomenal performer in mud and tough going. And with blade fully six inches higher, capacity is kept on par with conventional blade.

SIMPLIFIED SERVICING. 1,000-hour lubrication of truck wheels, idlers and support rollers. Dozer mounting does not interfere with engine accessibility. No removal of major tractor assemblies. Hinged grill swings out for easy access to dozer hydraulic pump, or to clean radiator core.

EASY TO OPERATE. Just by pulling a single lever, operator can shift from any of the six forward speeds to any of the three high speed reverses. This, plus narrow, frame-mounted blade makes the HD-9 particularly fast and maneuverable. With no spring deflection, blade responds immediately and positively to control levers.



BITES DOWN HARD
Full 13-in. drop below ground, positive down pressure plus steep angle of penetration means fast digging.



HIGH LIFT — Full 37 in. above ground. Excellent for pushing over trees and stumps and clearing brush.

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NEWS NOTES...

AUGUST, 1952

...a resumé of current events throughout the railroad world

Rail-laying programs throughout the country have been seriously curtailed as a consequence of the steel strike. A typical example is the Rock Island which had received only 10,654 tons of new rail before deliveries were halted in June. The road had ordered 25,000 tons of new rail for this year's program.

•

The steel strike was also reflected to some extent in the June deliveries of new domestic freight cars. Such deliveries in that month totaled 6,411 cars as compared with 6,857 in May and 9,644 in June 1951. These figures were announced jointly by the American Railway Car Institute and the AAR.

•

The railroads last year collected and turned in more scrap metal than in any previous year in history. Although 14.7 per cent of the total scrap originated on the railroads, the carriers received only about 8.6 per cent of rolled steel distributed.

•

The United Railroad Operating Crafts has supplanted the Brotherhood of Railroad Trainmen as collective bargaining representative of road brakemen employed by the Western Pacific. In a recent election United defeated the BRT by one vote—157 to 156.

•

Plea for a freight car fleet of 2,168,000 cars by mid-1954 was contained in the sixth quarterly report of the Office of Defense Mobilization, issued by John R. Steelman, acting defense mobilizer. Attainment of this goal requires construction of 436,000 new cars during the four-year period from mid-1950, the report said.

•

Two railway presidents will be among the speakers scheduled to address the railway sessions of the 40th National Safety Congress to be held in Chicago, October 20-24. H. J. McKenzie, president of the Cotton Belt, will talk on the "Concepts of a Railroad President Regarding Safety," and T. D. Bevan, president, Elgin, Joliet & Eastern, will speak on "Safety's Place on the Railroads."

•

Figures put out by the Engineers' Joint Council on the supply of, and demand for, college-trained engineers contained bad news for the railroads as well as other industries. The number of engineers needed by industry for normal replacement and growth is put at 30,000 per year, but in protracted national emergency, it is estimated that 40,000 engineers will be needed per year. Engineering graduates are expected to total 28,000 in 1952; 19,000 in 1953; and 12,000 to 17,000 in 1954.

•

Authorization for construction of another building at the AAR Central Research Laboratory at the Illinois Institute of Technology, Chicago, to cost about $350,000, has been extended by the board of directors, AAR.

NEWS NOTES (continued)

F. S. Hales, vice president-operation, Nickel Plate, has been promoted to executive vice-president, and J. C. Wallace, general manager, has been promoted to vice-president-operation. Mr. Hales formerly served in engineering capacities, including that of bridge engineer, on the Nickel Plate, and Mr. Wallace was formerly chief engineer.

•

The total outstanding long-term debt of the Class I line-haul railways, as of December 31, 1951, amounted to $9,600.2 million, as compared with $9,280.9 million in 1950 and $10,462.8 million in 1943. The higher level of debt in 1951 as compared with 1950 is largely attributable to an increase of $436.7 million, or 23.6 per cent, in equipment obligations. These figures were compiled by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission.

•

Average weekly railroad carloadings in June 1952 were 11.1 per cent below the May 1952 level, and 20.8 per cent below June 1951. The sharp decrease as compared with last year occurred because of substantially lower carloadings of coal, coke and ore, and miscellaneous merchandise. However, grain and livestock loadings increased 24.8 per cent.

•

Post war rate increases made by the railroads on important commodities have ranged from 41.3 per cent on iron ore to 91.6 per cent on l.c.l., according to estimates made by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission. The average increase for all classes of traffic amounted to 78.9 per cent.

•

New heads for New York Central and Lackawanna. William White, heretofore president of the DL&W, has been elected president and chief executive officer of the NYC, effective August 1, succeeding Gustav Metzman, who becomes chairman of the board. Perry M. Shoemaker, vice-president, operations, DL&W, has been elected president to succeed Mr. White, also effective August 1.

•

ALSO WORTH NOTING—Lawrence W. Horning, vice-president, NYC, has volunteered to serve as chairman of the railroad and railway supply group in the 1952 Sister Elizabeth Kenny Foundation fund-raising campaign, which gets underway August 20. . . . By vote of 43 to 40, the Senate on June 18 sent back to its Foreign Relations committee a resolution to approve the United States-Canada agreement for construction of the proposed St. Lawrence seaway and power project. . . . The Defense Transport Administration has granted a six months leave of absence for Jonathan E. Teal, chief of the Way and Structures Section, Railroad Transport Division, to enable Mr. Teal to accept an engineering assignment with the Joint Brazil-United States Commission for Economic Development. . . . Five coaches to be built for the Grand Trunk Western lines of the Canadian National by the Pullman-Standard Car Manufacturing Company are said to be the first cars in North America which will feature electronically controlled heating systems.

G-E snowmelters keep switches open at low cost

The Cleveland Union Terminal is one of many railroads that have winter-proofed their switches with a General Electric snowmelter system. For several years approximately 200 G-E Calrod* heaters have demonstrated their ability to keep switches of the Terminal's twelve main-line tracks open under the worst ice and snow conditions. Costs have fully justified this installation. Operating costs amount to only a few cents per point per hour for power—and only when it's needed. Maintenance is practically nil. There is no danger of burning ties or rolling stock. Safe, uniform heat is applied where it is needed most. And G-E snowmelters are ever ready to start working whenever you need them by merely closing an electric switch.

Plan now for your winter snow-melting needs. Before you submit your 1953 budget, ask your General Electric representative for the full details on the G-E snowmelter system. ***General Electric Company, Schenectady 5, New York.*** 152-37

*Reg. Trade-mark.

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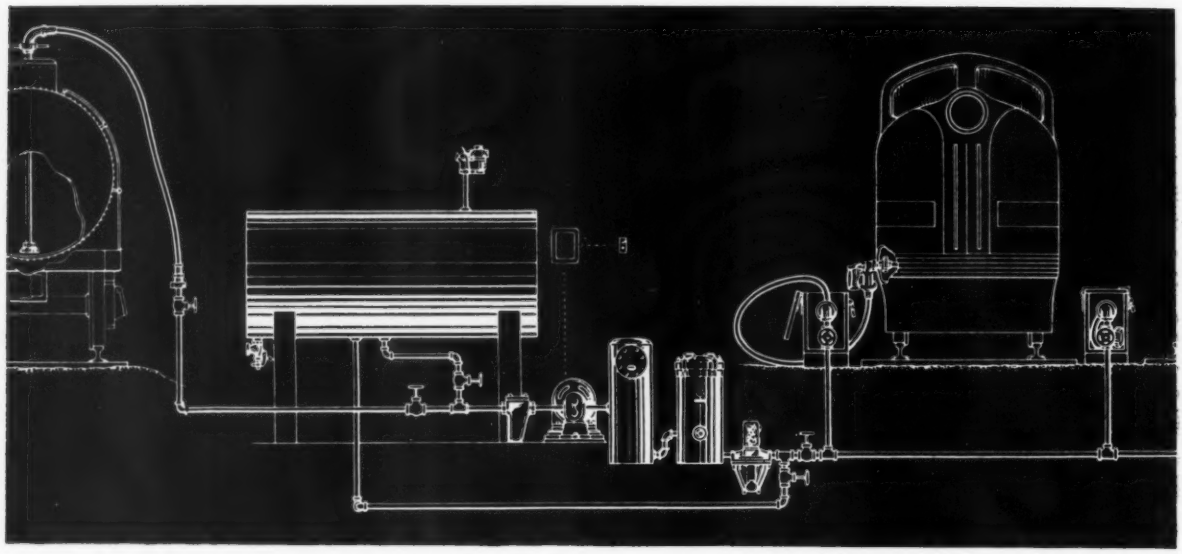
GENERAL ELECTRIC



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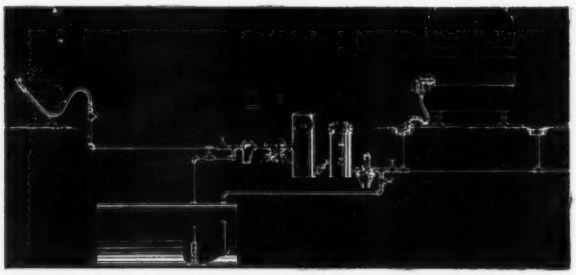
As the pioneer and foremost builder of equipment for railroad liquids, Bowser can A furnish complete engineering service and can B supply all the necessary equipment for proper installations of complete liquid handling systems . . . and C as both engineers and manufacturers, Bowser will accept full responsibility in assuring you of complete satisfaction.

Consult with the Bowser man in your territory on any railroad liquid handling problems. There's no obligation.

Metered lubricating oil



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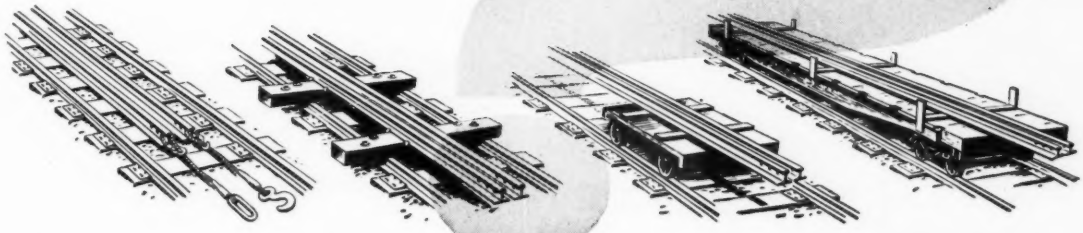
What's the best way *to transport* "RIBBONRAIL"



DRAGGING?
. . . fastening a chain or wire cable to the end of a long length and dragging it to the laying site.

SKIDDING?
. . . using skid ties to serve as runners on the rail in track. Welded rails are placed on skid ties and held by rail anchors.

PUSH CARS?
. . . hauling the long rails on push cars.

FLAT CARS?
. . . hauling the long rails on flat cars.

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"Styled"

for non-overloading high efficiency

All Layne Impellers—the business end of a pump—are "styled" for the very maximum in high efficiency. Free from the overloading fault, these impellers are capable of producing tremendous quantities of water at unmatched low cost. All are hand finished inside and out to provide utmost accuracy.

If you are in need of a vertical turbine pump to produce water from a well, lake, reservoir or river—or as a pressure booster for a water main, write for a catalog on Layne Pumps. No obligation.

But whether you are checking impellers, pump bowls, shafting, bearings or other parts of a water supply unit, it is important to remember that Layne built wells and pumps are rated as the world's very finest. Everything about these units, are engineered for long years of top flight efficiency. Satisfactory service, extra heavy production and absolute freedom from structural weakness.

For further information about well installation services, sizes and types of pumps or a complete water supply contract, address

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WATER WELLS
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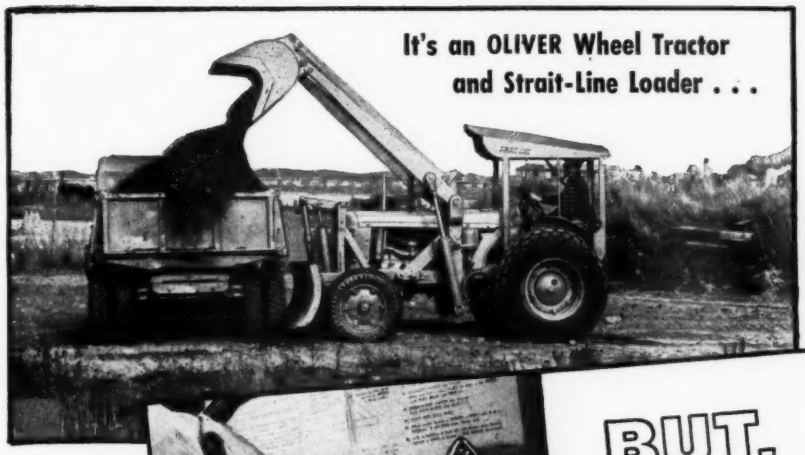
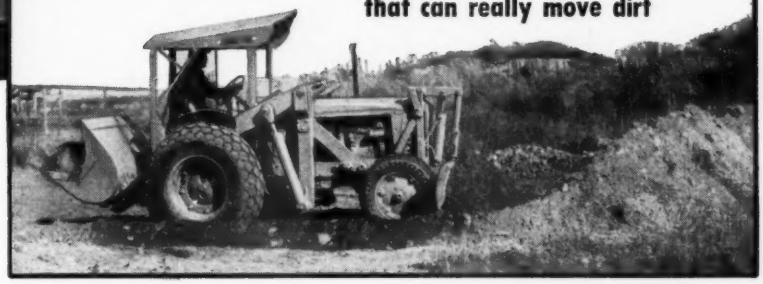
"Quick Change Artist"

...that saves Your time and money!



BUT,
push this little lever...

and you have a wheel-dozer that can really move dirt



Now, it's an Oliver Wheel Tractor and *Strait-Line* Loader. But, push a little lever and *presto* . . . it's the most amazing bulldozer or angledozer you've ever seen.

You undoubtedly know the advantages of the Strait-Line Loader . . . the loader that digs in back, swings its load overhead, and loads in front. You know that the rear-carried bucket load multiplies traction . . . makes steering easy.

But now, you can get a "quick change" bulldozer and angledozer blade for the Strait-Line. Just push the little lever and, quick as a flash, you switch from loading to dozing. Pull the lever . . . you're ready for loading. Remember, by carrying the loaded bucket in the rear, you get unparalleled traction that puts real "push" behind the blade. It makes wheel tractor dozing a reality! You can load trucks without dismounting the blade.

For informative literature see your Oliver Industrial Distributor or mail the coupon.

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***Industrial Division:* 19300 Euclid Ave., Cleveland 17, Ohio**

A complete line of industrial wheel and crawler tractors

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The track ahead of the McWilliams Ballast Distributor after renewal and spacing of ties.

PLACES BALLAST . . . IN ANY QUANTITY... *EXACTLY* WHERE IT IS NEEDED

This important new track maintenance development places ballast in perfect position for tamping . . . both inside and outside of the rail. Operating with a crew of one man, it picks up ballast dumped outside of the tracks and deposits it exactly where it is needed for tamping. The location and quantity of ballast are absolutely controlled.

THE *NEW* McWILLIAMS BALLAST DISTRIBUTOR

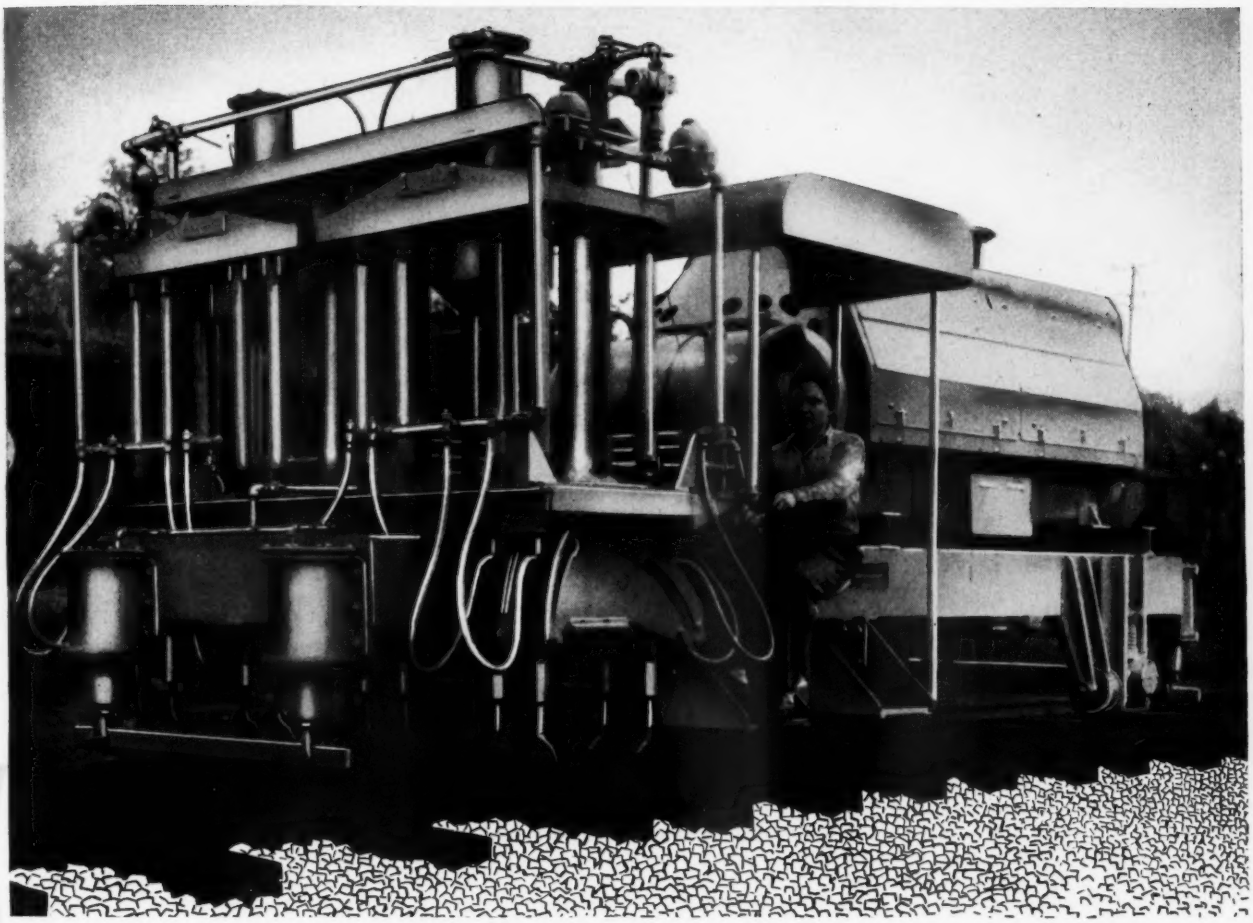
A GREAT NEW TAMPING TEAM

In service . . . it's saving one railroad $400 per day by replacing 30 men

Although developed as a companion to the McWilliams Tie Tamper, this machine will speed up and improve any mechanical or hand tamping operation. An important cost saving feature is the fact that track always is left clear of new ballast until tie renewal and spacing are completed. The machine follows the tie gang ahead of the tamper. In its first application . . . where it is saving $400 per day for a major Eastern railroad . . . it definitely has proved its ability to distribute ballast faster and more accurately than a crew of 30 men. Using any type of ballast, this machine will distribute it properly for any desired track raise.

Write for details on how the McWilliams Ballast Distributor will improve your tamping operations.

For additional information, use postcard, pages 739-740



The Service-Proved McWILLIAMS TIE TAMPER

The most versatile . . . most efficient Tie Tamping Machine ever developed

This is the only tamping machine which compacts the ballast firmly *under the rail* . . . with no danger of crushing the ballast. The unique split head design permits tamping of all kinds of ties—crooked ties, slued ties, out-of-line ties. The McWilliams Tie Tamper also can be used for picking up low joints or surfacing where one rail requires more tamping than the other. *Write for complete details.*

These features assure you of better maintained track

- **Operating rate: 350 to 450 feet per hour of perfectly tamped track**
- **Controlled tool pressure does not crush ballast**
- **Will tamp track raises from ½" on up**
- **The compressor can be used to operate other air equipment**
- **By far the easiest tamper to maintain. All working parts accessible for easy removing and replacing in the field**

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Easier, Faster Spiking

with G & H TIE NIPPER

Developed and successfully used in conjunction with out-of-face track surfacing gangs where tie renewals run fairly heavy. Also employed with the same effectiveness with rail laying crews, or in any other place where ties have to be nipped up for spiking.

The nipper will hold a tie against the rail while it is being spiked with pneumatic spiking hammer. Both ends of tie can be nipped together, or one end at a time. One man can perform the operation, whereas with hand tools, two to four men are required, depending on condition of sub-grade, etc.

The G&H Tie Nipper can be used in all types of track work where spiking of ties or even tamping of ties requires them to be held to the rail.

Modern in design, up-to-date in construction, this device will assist greatly in reducing maintenance costs.

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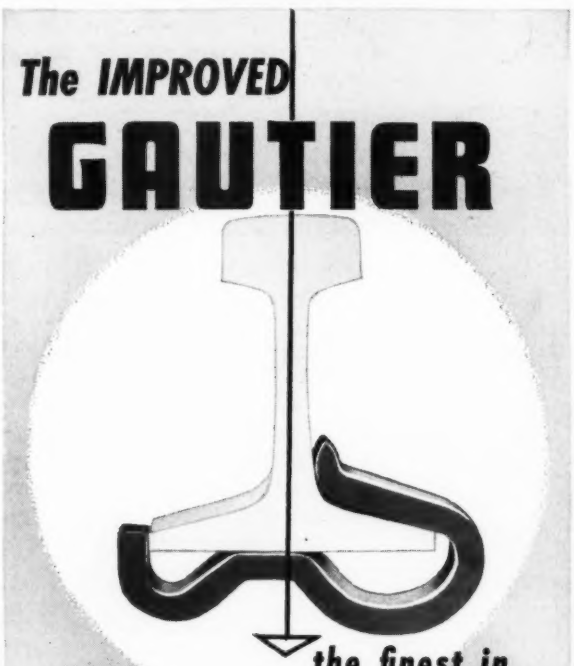

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WITHOUT LEARNING AT FIRST HAND HOW MUCH YOU CAN SAVE *and* ACCOMPLISH *with a*

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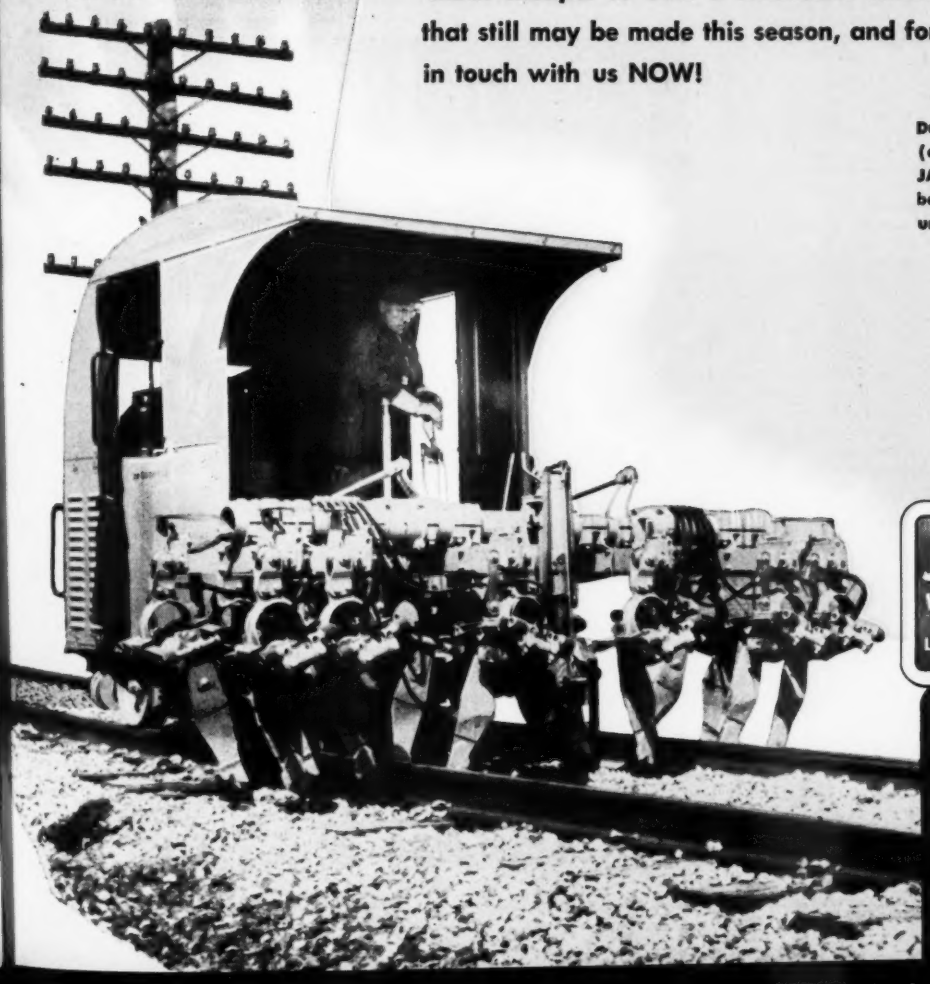
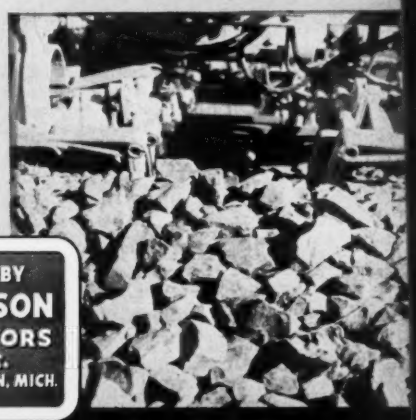
TRY ONE ON YOUR OWN TRACK

You don't have to buy it. We will be glad to place one on your track on a sa and equitable basis. And the reason we are so inclined is because we a confident that when you observe it in operation, see the high quality of track produces, regardless of lift or type of ballast used, and note the speed with whic it does it, you will be convinced that there is nothing to equal it, and that it much cheaper to own a JACKSON MULTIPLE than to do without it. For saving that still may be made this season, and for larger savings in the years to come, g in touch with us NOW!

Due to its three sets of quickly interchangeable blade (each designed for a specific set of conditions) th JACKSON MULTIPLE operates at peak efficiency in a ballasts and all lifts. No other on-track tamper is s universally efficient or versatile.





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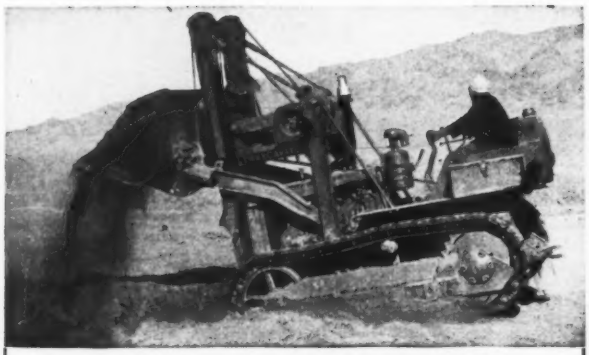

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SHOVEL AND ANGLEGRADER
BUILD RAILBED
...IN IRAN!

The Kamkar Corporation is levelling ground to lay rail for a new line near Nishapur, Iran—and a T4 TRAXCAVATOR Shovel is doing the work.

The T4 calls on its 43 drawbar HP crowd to heap a full yard of the dry, sandy soil into its bucket. Loads are hauled 75 feet to fill small gullies and washes in the path of the road. Over 60 cu. yds. are moved each hour—at minimum cost per hour.

For short 'dozer work, the T4 pulls a quick change—adds a Trackson ANGLEGRADER—and work is done in a hurry. Blade is attached in a matter of minutes.

Iranians are adopting the successful methods of American railroads in building their lines—*and using TRAXCAVATOR Shovels!* If you haven't had a versatile, economical TRAXCAVATOR Shovel on your off-track construction and maintenance work, call your "Caterpillar" Dealer. He can show you how they can serve you . . . or write direct.

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TRACKSON

Reg. U. S. Pat. Off.

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TRAXCAVATOR® SHOVELS
PIPE LAYERS
TRACLOADERS
ANGLEFILLERS

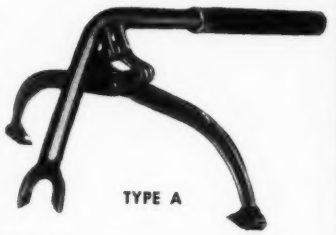
Mack "Quality First" Products
for the safe handling of ties and timbers

Mack
SAFETY HAND TONGS

Two sizes "Standard" & "Large." Light-weight, high strength. Handle of cast aluminum with replaceable tool steel points. Swinging tong drop forged steel.

Mack
SAFETY TOGGLE TONGS

Three types "A", "B" & "C." For the safe handling of railroad ties, bridge timbers, poles, and other forest products. Drop-forged steel construction. Light-weight toggle action insures safe grip on load under all conditions. Replaceable points.



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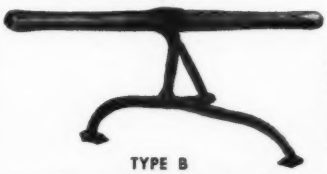

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Write for description and prices. Also ask for data sheets on Mack Grapples, Pole Tongs, and Snow Buckets.

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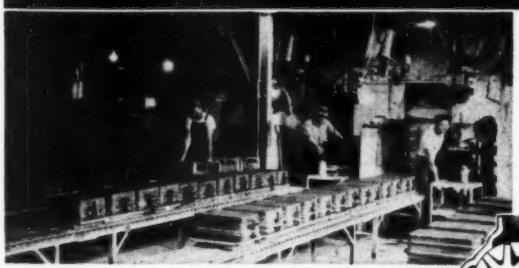

A partial view of moulds being made in Viking's bronze and aluminum foundry.

A pump can be no better than the material that goes into it. All Viking pumps are made from castings poured in our own rigidly controlled Sorbo-Mat foundries.

When you buy a Viking pump, you are assured of the finest gray iron and non-ferrous parts available for the application. This is just one of the reasons you can expect better and longer service from Vikings—the original gear-within-a-gear pump—the design that made rotary pumps famous.

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AN HONORED NAME IN PUMPING

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Viking PUMP COMPANY
Cedar Falls, Iowa

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One of the 160 Uses of CONCRETE on Railroads

NO. 8 OF A SERIES

This grade separation on the Chicago & North Western Railway in Winnetka, Ill., is an excellent example of concrete's beauty, economy and durability. The ornamentation, cast integrally with the structural parts, is based on local Indian legends.

Concrete grade separations are just one of the more than 160 uses for concrete which enable American railroads to improve service and save time and money. The moderate first cost of such concrete improvements—plus their long life and low maintenance cost—result in true *low annual cost*. This saves money for other necessary items.

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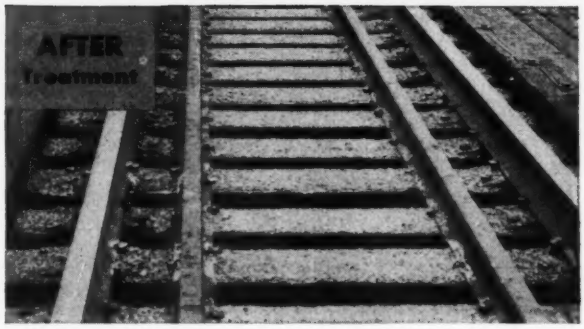
33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

TIE LIFE LENGTHENED
with Koppers Tie-Sealing Compound

THESE 14-FOOT BRIDGE TIES are in danger. Unless splits and cracks shown here are retarded, they will get progressively worse. The heart of the ties will be exposed to decay, and tie failure will eventually result. Replacement of these ties would, of course, be expensive.



KOPPERS TIE-SEALING COMPOUND, a specially-processed coal-tar coating, was applied by brush. Cracks were filled and sealed with this water-resistant coating. Tie replacement will be deferred an estimated 5 to 10 years. Maintenance is also reduced. The fine stone cover is an armor against fire.

KOPPERS

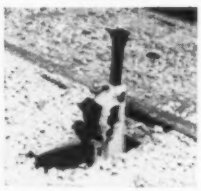
Use Tie-Sealing Compound on your railroad system. Details and price information on request.

KOPPERS COMPANY, INC., Tar Products Division, Pittsburgh 19, Pa.

SET FIRMLY — STAND STRAIGHT

FOR THE "BIG LIFT" IN

Track Jacking



For track maintenance, including surfacing, lining, tamping-ballasting, tie plate renewal, and in conjunction with welded rail, you'll find—among other features—that Simplex Aluminum Alloy Track Jacks set more firmly and stand straighter. The large 2½" x 3¼" forged (not a welded plate), machined toe gives the "big lift" easily under rail or under ties without damage. Sturdy, lightweight, Aluminum Alloy housings are reinforced at all stress points. Greater bearing area of rack bar on housing gibs reduces wear. Simplex Jacks lift full capacity on toe or cap.

SIMPLEX 16A
Full 6" lift—highest of any surfacing jack. Minimum toe height 1½". Eliminates ballast removal; less digging in under-tie work. Trips from right or left. Improved safety thumb guard. Capacity 15 tons; weighs only 28 lbs.

SIMPLEX A5
Capacity 15 tons; weighs only 28 lbs. 5" lift.

SIMPLEX A17
Capacity 15 tons; weighs only 41½ lbs. 13" lift.

Simplex LEVER • SCREW • HYDRAULIC Jacks

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1026 South Central Avenue • Chicago 44, Illinois

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railroad fasteners

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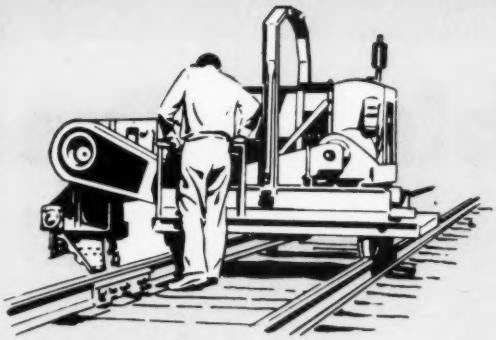


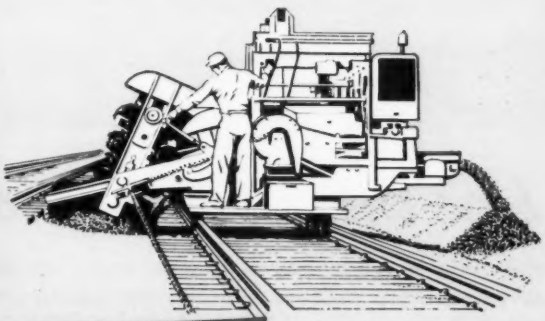
CRIBEX

Removes material contained in the cribs and deposits it beyond the ends of the ties. Leaves a smooth, uniformly-graded tie floor, completely emptying the crib without damage to ties or rail. *Proved in use in excavating over 3,500,000 cribs.*

SCREENEX

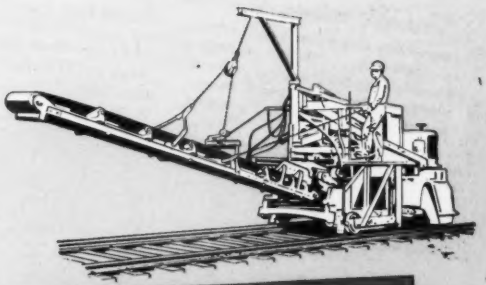
Takes fouled, excavated ballast from BALLASTEX, passes this material over a vibrating "*SYMONS*" Rod Deck Screen and returns cleaned ballast to the track, intertrack, or shoulder in any desired proportions—wasting the screenings to the side beyond the shoulder.

THESE *HUSKY*
NORDBERG MACHINES
HAVE PROVED THEMSELVES ON THE *TOUGHEST* MAINTENANCE JOBS



BALLASTEX

Excavates ballast in the area between the tracks or in the shoulder and disposes it by either wasting to the side or feeding it to the SCREENEX for cleaning. Digs a uniform trench 42-inches wide, or any desired depth to a maximum of 30-inches below top of rail.



DSL YARD CLEANER

Cleans track faster, better, at lower cost—right down to the ties—without damaging them. Moves on the rails with plows grading the intertrack and feeding material into an impeller, which deposits material on conveyors for disposal into cars on an adjacent track, into dump body push trucks or over the bank—as desired.

The speed, economy and versatility of the CRIBEX . . . BALLASTEX . . . SCREENEX and YARD CLEANER has been amply proved in service. Let us show you how these modern maintenance machines can save time and money for you.

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R952

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NORDBERG MFG. CO., *Milwaukee, Wis.*

NORDBERG MACHINERY

All in a day's work for rubber-tired

Travels along or across tracks . . . drives anywhere along right-of-way *without planking.* Flexible tires straddle rails . . . do not damage ballast . . . ride on ties without chamfering, thus saving maintenance. Tough tread lugs and sturdy rayon cords absorb shocks . . . tires easily flex, and roll over obstacles instead of grinding through them.

All-year materials handling . . . On shuttle operations, Tournadozer stockpiles coal, sand, cinders, chemicals and other materials more economically than crawler dozers. With faster forward and reverse speeds, it can handle 2 to 3 times more yards per hour the year-'round. Husky, two-foot wide, low-pressure tires assure safe compaction of combustible materials without reducing them to fines.

In less than 4 minutes,

this highly mobile dozer travels a mile under its own power to handle any railroad maintenance job in your yard or along the right-of-way. Ready to run at a moment's notice, independent of trailer delays or expenses, rubber-tired Tournadozer can be driven via any surface to job at 19 m.p.h. And, it's ready to go to work right away!

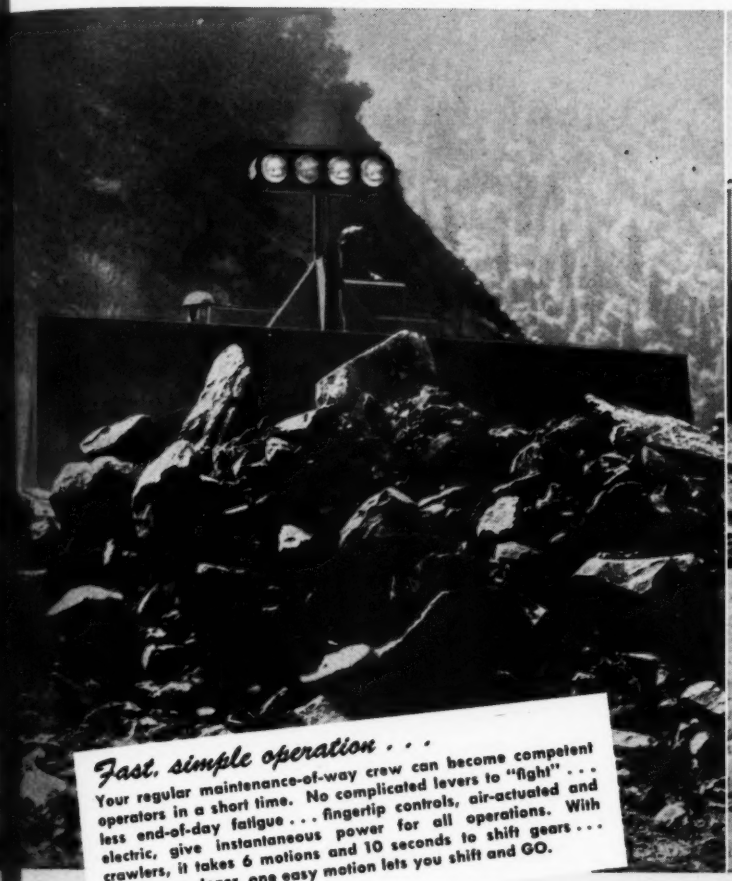
Crossing tracks and riding over ties without danger of chamfering, Tournadozer easily spreads cinders around your yard or roundhouse, highballs out to clean drainage ditches, remove slides, cut down banks, fill washouts, reinforce causeways or bridge approaches . . . one operator and one Tournadozer can do many of these and similar maintenance tasks *in a single day.*

Cuts dozing time in half

Tournadozer not only gets to jobs in less time . . . it also finishes them sooner. Rig moves fast in tough footings

Tournadozer—Trademark Reg. U. S. Pat. Off. D-78-[illegible]

railroad Tournadozer



Fast, simple operation . . .
Your regular maintenance-of-way crew can become competent operators in a short time. No complicated levers to "fight" . . . less end-of-day fatigue . . . fingertip controls, air-actuated and electric, give instantaneous power for all operations. With crawlers, it takes 6 motions and 10 seconds to shift gears . . . with Tournadozer, one easy motion lets you shift and GO.

Handy in emergencies . . .
Tournadozer can do emergency switching or spot work train cars. This versatile off-track, on-track, cross-track rig can also quickly remove slides, fill washouts, clean up at wrecks, straighten tracks, reinforce causeways and bridge approaches. Rig requires no work train or crew . . . easily drives off right-of-way at approach of train to eliminate tie-up of rail traffic.

with big 2½ yd. load . . . backs up fast for next pass. Four speeds forward to 19 m.p.h. and two speeds in reverse up to 8 m.p.h. help you complete each dozing cycle in about one-half the time it takes the average crawler.

No stopping to change gears

Instant gear changes with constant-mesh transmission plus torque converter (optional), and simplified operating controls put Tournadozer's constant power to work without loss of momentum. In addition, 186 h.p. four-wheel drive on 21.00 x 25 low-pressure tires means plenty of power and traction to hang on and move heavy loads even in toughest going. Down pressure now available on rig's big 2½-yard blade, helps get quick penetration in wet-frozen sand, clay, hardpan, etc. All these modern advantages contribute to more work done in all kinds of weather, every day of the year.

Tournadozer's 19 m.p.h. "run-about" mobility, its job-proved work ability and its low operating upkeep make it the kind of tool you need for your maintenance tasks. Compare it with dozing equipment being used in your division, and you'll see why major dirtmovers and industrial and railroad officials, like yourself, are adding modern Tournadozers to their equipment fleets.

For more information on these and other Tournadozer railroad applications, plus descriptive bulletin and owner-verified performance reports, write direct or contact your LeTourneau Distributor. He will be happy to help you without obligation.

Ask for bulletin TD-117

LETOURNEAU

R. G. LeTOURNEAU, INC.

No. 284 of a series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION
79 W. MONROE STREET
CHICAGO 3, ILL.

Subject: An Editorial Headache

August 1, 1952

Dear Readers:

I wonder if you are fully aware of the extreme measures that are habitually taken by magazine editors to avoid allowing mistakes of any kind to get into print. Because an editor knows that errors in his final product can have all sorts of repercussions, including loss of confidence in the magazine by its readers, he is willing to go to almost any lengths to eliminate them. One of the first things he learns is that, while doctors can bury their mistakes and lawyers can get a new trial, the mistakes of editors are there in black and white to haunt them the rest of their lives.

In our efforts to keep mistakes from getting into print the editors of Maintenance are no exception to the rule. Every piece of "copy" that is written for this magazine is check read not only by the editor who wrote it but by at least one other editor. All staff-written articles dealing with developments on particular railroads are sent to the companies for checking. When the material has been set in type the "galley" proofs are not only check read at the printshop but also in the editorial office. When the type has been made up in page form the page proofs are again read carefully as a final check before being marked "OK."

This matter of checking is a great deal more than merely looking for mistakes in facts, in spelling and in punctuation. The most serious errors sometimes occur in the least expected manner or places. For instance, it is not uncommon for an engraving to be placed in a page upside down, or for "slugs" or lines of type to become displaced or transposed, or for the wrong names to be placed under portrait cuts in the news section. It logically would be expected that only a glance at a page would be necessary to spot such serious mistakes, but actually, unless he is thoroughly experienced in this kind of work, a person might become so absorbed in searching for minor errors as to overlook entirely a blunder of major proportions.

The possibilities for the occurrence of mistakes in printed matter are almost unlimited; this fact, and the potentially serious consequences of some types of mistakes, combine to produce a continual source of headaches for editors. That is why such extreme measures are taken to avoid editorial mishaps. Human frailties being what they are, editorial mistakes do occur occasionally, just as personal injuries continue to happen on the railroads in spite of strenuous efforts to prevent them, but those few errors that do get by the editors are certainly a minute fraction of the number that are detected and corrected.

Yours sincerely,

Merwin H. Dick

Editor

MHD:lw

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ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

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one man can lift off track

Summer or winter, the WOOLERY 300 is the tireless, dependable work-horse of the gang. Low maintenance and uninterrupted service are well-known features of this rugged motor car, but its real value lies in the easy handling and all-weather dependability that has won the confidence of the men on the line!

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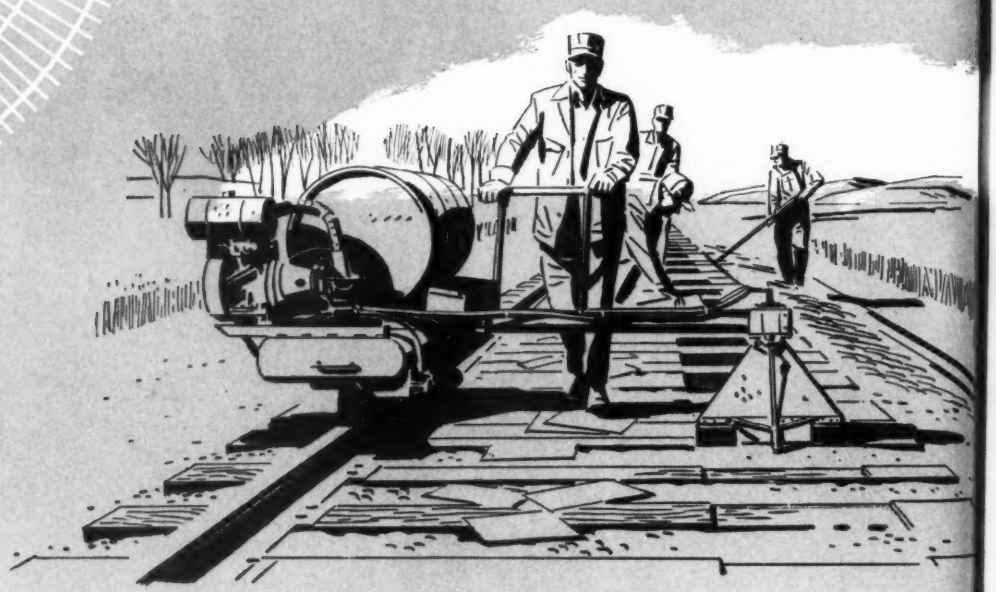

Performance ON THE JOB COUNTS

Tie preservation is one of the most important responsibilities of railway maintenance. For this reason, Fairmont is constantly designing and building better tie spraying equipment. The W71 Series A Tie Sprayer, pictured above in operation, embodies virtually all of Fairmont's important developments in this field. It is a completely self-contained unit and requires but one man for operation. As the unit moves along the track, a valve trip automatically turns the spray on and off over the freshly adzed ties—providing an unusually low average consumption of approximately 25 gallons of preservative per mile of single rail. Good penetration is assured because the preservative is kept hot at the nozzle spray, regardless of operating conditions. Another important feature of the W71 Series A Tie Sprayer is that it can be operated in either direction with the spray head, the hood assembly, and the push handles being reversed and locked. This W71 Tie Sprayer has proven itself time and again by performing where performance really counts—*on the job!*

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Progress—

Giving Credit Where Credit Is Due

As a rule, engineers are not much inclined to "toot their horns" insofar as their accomplishments are concerned. The result of this modesty is that the public in general has very little appreciation of the contributions that the engineering profession has made to industrial and social progress. However, this situation is now to be remedied, at least in part, through the agency of a Centennial of Engineering celebration which is already underway at Chicago and which will continue through September. The purpose is to commemorate the 100th anniversary of the American Society of Civil Engineers, the first national society of civil engineers in the United States, but the event has been broadened to include participation by engineers in all branches of the profession.

During the past 100 years no single group of engineers has made a greater contribution to the progress and development of the country than the engineering and maintenance men on the railroads. These men supervised the design and construction of the vast railroad network that is now serving the country so well, and in so doing they had to create an entirely new body of applied engineering knowledge. With the era of railroad expansion now definitely over, they have turned their skill and energy, with outstanding success, to the engineering problems involved in maintaining the railroad properties and in designing and making the improvements needed to keep them at a peak of efficiency.

It is only natural, therefore, that the Centennial of Engineering should give recognition to the accomplishments of the railroad branch of the profession. That such recognition is being extended is reflected by the fact that the American Railway Engineering Association has made elaborate plans to participate in the celebration. These plans, as given in detail in the news columns of this issue, contemplate various events including a banquet, and to implement them the association has scheduled meetings of all its standing and special committees to be held at Chicago early during the week of September 8.

Those who have been entrusted with responsibility for planning the A.R.E.A. events in September are to be commended for the enterprise and zeal with which they have approached their task, and particularly for the care they have taken to assure that all branches of the railway engineering profession will be represented. It is particularly gratifying to learn, for example, that the presidents of the Roadmasters' and Maintenance of Way Association and the American Railway Bridge and Building Association have been invited to sit at the speakers' table at the banquet.

This recognition that has been extended the two associations of maintenance supervisory officers indicates a keen awareness of the important role of the so-called "practical" engineer in the railroad field. Roadmasters, track supervisors, master carpenters, supervisors of bridges and buildings, and others of similar rank, comprise a group of employees whose aggregate contribution to the welfare of the railroad industry cannot be overestimated. It is only fitting and proper that this contribution should receive recognition in connection with the Centennial of Engineering.

B. & B. MEN—

Are They Using Enough Equipment?

TO A person traveling around on the railroads, the growing mechanization of the track forces is evident by the many on and off-track machines that are seen in use today for rail-laying, ballasting and right-of-way maintenance operations. When bridge and building gangs are observed, however, it is noted that in many cases comparatively little use of mechanized equipment is being made by them, which raises the question as to whether all b. and b. officers have embraced mechanization to the same extent as their colleagues in the track department.

It is a fact that the maintenance of the track lends itself more readily to mechanization than does bridge and building work because, for one thing, track work normally involves the repetition of a number of operations over and over again in consecutive order, whereas b. and b. work, on the other hand, is more often a matter of performing a wide variety of intermittent operations that have no particular order. However, there are many b. and b. operations that can be done more efficiently with the aid of available machines; the problem is merely one of using these machines.

Much bridge work involves the lifting of heavy members into position, and it is in this sphere that power hoists, truck cranes, crawler-type cranes and small on-track derrick cars can be particularly helpful. While many system bridge gangs are relatively well equipped with these and other machines and power tools, many division gangs are not. Yet there is a large assortment of equipment that can be used economically by these gangs.

It is heartening to note that the b. and b. forces are out in front when it comes to the use of trucks for the transportation of men, tools and materials. It is interesting to note also that a few roads are replacing their old steam boilers on pile-driving rigs with modern oil-fired steam generators. Many roads, however, are continuing to use the old outfits with their drop hammers that unquestionably should be replaced with modern outfits having hammers with a higher output of energy per minute. Some roads have found off-track cranes with suspended leads and double-acting hammers to be effective, while others are exploring the possibilities of the self-contained diesel hammers and of various types of compressed-air hammers.

Because most of the power tools used in b. and b. work are not self-contained, a modern power plant, of adequate capacity, and driving either an electric generator or an air compressor, is a primary requisite for a gang. One road has found that there are advantages in having a number of small mobile compressors, spotted at various locations around the site, because a failure of one of the compressor units does not tie up the work of the remainder of the gang.

The wide variety of electric and air-powered tools now available offers a vast opportunity to lighten and speed up the work of the bridge and building forces, thus increasing production as well as assuring satisfied workers. But the paucity of equipment now in use by b. and b. forces leads one to wonder if all railroads are taking full advantage of the opportunities for mechanizing these forces.

A GOOD DAY'S WORK—

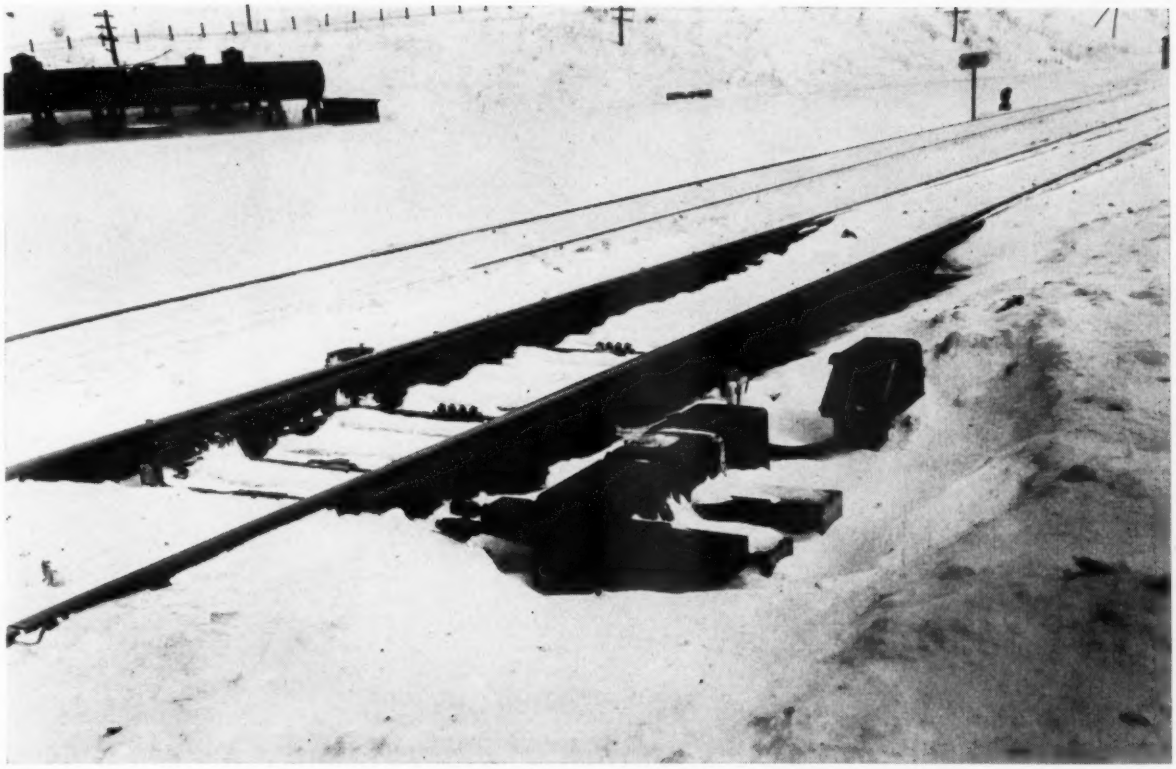
Yesterday's Standards Are Now Obsolete

"If my supervision knew what constituted a good day's work, under present conditions, for a track gang or an extra gang, I'd have one of the most efficient maintenance organizations on any railroad," mused a high-ranking railway officer recently. "But they don't," he continued. "They are still living in the past, judging the production of their forces by the standards they set for themselves when they were foremen or subordinate supervisors. They worked hard to set those standards and they doubt if any one should be asked to do more than they did or to work any harder."

There is evidence galore that this maintenance officer is not alone in his dilemma. Others, too, have bemoaned the existence of the same situation on their roads. What's to be done about it? In the first place, the very recognition and acknowledgment of the dilemma counts the problem half solved. With the knowledge that there is a problem comes the quick realization that subordinate supervision has been so steeped in its own troubles that to some extent it has been unable to keep its sights parallel to the steadily increasing attainments possible through technological improvements. The most alert person is apt sometimes to be lulled into such an attitude.

It is not difficult to see the crossroads at which the wrong turn was made. With that understanding comes the realization that when supervisors ask their men to produce more now than they did long ago, they are not demanding that their men work harder. Instead, they are merely pointing out that, for the privilege of less arduous work in handling a machine or power tool, and higher pay while doing it, the higher production of which modern machines are capable is certainly to be expected. No longer can the production of labor plus machines be judged by even the best accomplishments of men alone. More ties must be put in per day, more track tamped, more rail laid. Unless production is increased, somebody is not doing a "good day's work."

For the trackman that scoffs, if any does, let him be reminded of the days when he had to pivot a tamping pick on forearm, elbow and knee, day in and day out. Or let the carpenter recall the days when he was master of the handsaw, or it of him, and compare them with the present use of his many power tools. Surely these memories will bring the realization that a "good day's work" to-day is easier than yesterday's and more worthy of accomplishment. Is that too much to ask of present-day labor?



IN YARDS AND TERMINALS, where switches are more or less grouped together, propane switch heaters may be effectively operated from gas stored in large bulk tanks such as those shown in the background at the left in the above photograph

What Savings with Propane Switch Heaters?

Here are figures, lots of them, compiled by one railroad during the 1950-51 winter season, which show that self-starting gas burners . . .

- **Reduce expenses by as much as 80 per cent**
- **Return 61 per cent on investment**

• Push-button operation of snow melters, when first applied to propane gas heaters about four years ago, was considered an important forward step; but many observers wondered at that time if such a "dream" device might not cost too much to install and operate. That doubt has now been dispelled by a cost analysis of one major road's use of propane heaters throughout an entire snow season on 73 switches and two derails operating under a variety of service conditions. A comparison of the major items of cost resulting from this study is given in Table III. Other tables provide basic supporting data.

As indicated in Table I (see next page), Type A heaters were in use on 57 switches and two derails and Type B heaters were installed on 16 switches. The number of inspirators used on Type A heaters varied from one on each stock rail at the derails to three per stock rail on the 24-ft. and 30-ft. switches. On switches equipped with Type B heaters, a single inspirator per stock rail was installed on each 24-ft. switch and two per stock rail on each 30-ft. switch.

Of the 59 switches and derails equipped with Type A heaters, 54 switches and the derails had hot-wire ignition, two switches had spark ignition and one switch had three types of ignition for test, consisting of a hot wire on one section, a spark provided by a high-tension coil on the second section, and a spark from a propane-gas driven magneto on the third section of the heater. A total of 37 of these switches were provided with return indicators and the rest were not.

Control of the ignition of 31 of these switch heaters was by means of coded current, while six were remote controlled by direct wire, one by a simplex on a telephone circuit, and 21 were ignited by direct wire from local towers.

Energy for ignition was furnished by a storage battery housed at each switch. All storage cells had a rated capacity of 220 ampere-hours except one set of nickel-iron storage cells rated at 112 amp.-hr. in use for test. The 220 amp.-hr. cells were charged at the end of the switch heater season and then stored for use in the following season. The 112 amp.-hr. battery is trickle charged throughout the heater season.

All of the 16 switches equipped with Type B heaters had hot-wire ignition, with 15 having return indicators. A total of 13 of these heaters was remote controlled via code and three via direct wire. Energy for ignition of all Type B

COMPARISON OF COSTS of snow removal by the common manual methods (as illustrated in the photograph above) and through the use of automatically-controlled propane gas switch heaters, is presented in detail in Table III on the following page

Table I—Length and Number of Switches Equipped with Heaters, and Number of Inspirators

Length of Switch (ft.)	Type A		Type B	
	Number of Switches	Number of Inspirators	Number of Switches	Number of Inspirators
6½	2	2	—	—
16	21	84	—	—
22	2	8	—	—
24	1	6	2	4
30	33	198	14	56
Totals	59	298	16	60

heaters was furnished from the storage cells now in use for the signal apparatus through underground cable of large copper cross section.

The propane gas for use with the switch heaters was either stored in 100-lb. cylinders or bulk tanks. The Type A heaters on 28 switches and one derail were furnished propane gas from 492 cylinders, of which one half were in use for normal operation and the other half for standby service. The Type A heaters on 29 switches and one derail were furnished propane from bulk tanks, 13 of which had a capacity of 1800 gal. each, four of 500 gal. and one of 2500 gal. The 16 switches equipped with Type B heaters were furnished propane gas from 666 cylinders, one half of which were used for normal operation and the other half for standby service. Of the 1158 cylinders in use, 704 were purchased outright and the remaining 454 were leased from the gas companies.

Both types of heaters on the 73 switches and two derails under analysis burned an aggregate of 12,239 hr. during the 1950-51 winter, consuming a total of 183,702 lb. of propane costing $8,364, or $0.0455 per pound. The Type A heaters on the two derails and 57 of the switches burned a total of 10,068 hr., used 110,531 lb. of propane costing $5,370, or $0.049 per lb. The Type B heaters on 16 switches burned an aggregate of 2,171 hr., used 73,171 lb. of propane costing $2,994, or $0.041 per lb. For further analysis, these figures have been broken down for each type of heater to show the average use per switch in hours, the propane used per switch, the propane used per switch per hour, and the propane used per inspirator per hour. This information is shown in Table II.

To compare the cost of operating propane switch heaters at the outlying switches among these installations with the expense of manual cleaning, assisted by kerosene heaters, a study was made of actual charges reported for snow and ice removal at both ends of a passing siding subjected to the same snow storms as the heater-equipped switches. These charges amounted to:

1,056 man-hours (straight time)	$1,328
432 man-hours (overtime)	815
144 man-hours trucking kerosene	197
3,750 gal. kerosene	375
Total	$2,715
Total cost per switch	$1,357
Add 10 per cent for inflation	136
Grant total	$1,493

Since only 17 of the 73 switches equipped with propane heaters were at outlying points, the cost of manual snow removal at groups of switches had to be estimated from general snow-storm statistics. From these statistics it was estimated that it would have cost $25,500 to remove the snow and ice from five groups of switches simulating the grouping of those equipped with heaters. These groups included one of seven separate switches and one derail, another of four switches,

two groups of five switches and one of eight, making a total of 29 switches in all. This meant that the approximate average cost of snow-and-ice removal per switch would have been $880.

Using this figure for the grouped switches and that previously developed for outlying switches, the estimated cost of manually removing snow and ice from the switches equipped with each type of propane heater can be determined. Thus, for the Type A heaters, this estimate becomes:

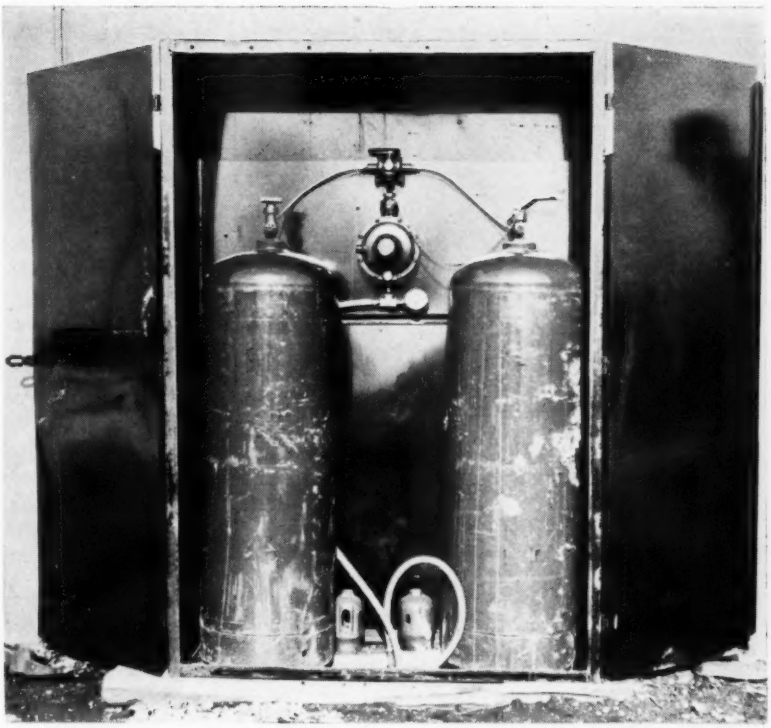
8 switches	$880.ea.	$ 7,040.
6 switches and a derail (7)	880.ea.	6,160.
5 switches and a derail (6)	880.ea.	5,220.
4 groups of 5 switches (20)	880.ea.	17,600.
4 switches	880.ea.	3,520.
3 switches	880 ea.	2,640.
5 outlying switches	1,493.ea.	2,640.
2 passing sidings	2,986.ea.	5,972.
2 switches at ends of single track	1,493.ea.	2,986.
Total cost of manual snow removal		$58,663.

For the Type B heaters the estimate is found to be:

4 outlying switches	$1,493.ea.	$ 5,972.
2 switches at ends of single track	1,493.ea.	2,986.
2 groups of 4 switches (8)	880.ea.	7,040.
1 group of 2 switches (2)	880.ea.	1,760.
Total cost of manual snow removal		$17,758

For convenience in comparing the cost of propane-heater operation with that of manual snow removal, these figures have been grouped in Table III. This comparison shows that the saving in the cost of operating the Type A propane switch heaters was about $47,000, or 80 per cent, as compared with the cost of cleaning them by hand. Thus on the basis of an installed cost of $76,859, they provided an annual return of about 61 per cent on the original investment.

Similarly, the Type B heaters saved $12,369, or 70 per cent, and made an annual return of 43 per cent on an investment of $28,721. Combining these figures, all the propane heaters saved $59,368, or 77 per cent, in expenses and produced an annual return of 56 per cent on a total investment of $105,580. These figures do not take into account interest costs which were considered insignificant in relation to the large savings.



PROPANE-BURNING switch heaters at outlying points are normally supplied with fuel from small tanks such as those shown here. Ignition is remotely controlled

Table II—Data on Switch Heater Installations, with Gas Consumption and Costs 1950-1951

	Type A	Type B	Both Types
Number of switches	59*	16	75*
Number of inspirators	298	60	358
Average inspirators per switch	5.05	3.75	4.78
Heaters in service (total hours)	10,068	2,171	12,239
Propane used (lb.)	110,531	73,171	183,702
Total cost of propane	$ 5,370	$ 2,994	$ 8,364
Cost of propane per pound	$0.049	$0.041	$0.046
Average use per switch (hr.)	171	136	163
Propane used per switch (lb.)	1,873	4,573	2,449
Propane used per switch per hour (lb.)	11	34	15
Propane used per inspirator per hour (lb.)	2.1	9.0	3.14

* Includes 2 derails

Table III—Comparative Cost of Snow Removal by Propane Heaters and Manual Labor

Items Analyzed	Type A Heaters	Manual	Type B Heaters	Manual	Both Types	Manual
Propane	$ 5,370	removal	$ 2,994	removal	$ 8,364	removal
Install & remove heaters	1,773	from	1,074	from	2,847	from
Handling propane	617	same	606	same	1,223	same
Maintenance expense	2,990	number	715	number	3,705	number
Rental of tanks	914	switches	—	switches	914	switches
Total	$11,664	$58,663	$ 5,389	$17,758	$17,053	$76,421
Savings in operating expense		$46,999		$12,369		$59,368
Reduction in operating expense (%)		80		70		77
Cost of switch heaters (installed)		$76,859		$28,721		$105,580
Annual return on investment (%)		61		43		56

A Non-Engineer Speaks . . .

About Railroad Opportunities for

A top-ranking executive officer of the Pennsylvania, not an engineer himself, gives his views regarding the opportunities for engineering graduates on the railroads. He stresses the importance of engineers in assuring railroad progress, gives concrete evidence of the high regard his road has for technical men (seven of its 12 presidents have been engineers), and describes the application of a course of training for young engineers on the Pennsylvania.

• "I doubt that any other industry can offer more to the young engineer today, all things considered, than the railroad industry. And I don't mind telling you that—as we have needed them in the past and as we need them today—so will we need them in the future. As a matter of fact, the railroads' prosperity and expansion over the years are more directly related to engineering than any other technical profession." Thus spoke J. M. Symes, executive vice-president of the Pennsylvania in an address on "The Civil Engineer in the Railroad Industry" at the 100th Anniversary meeting of the American Society of Civil Engineers in Philadelphia on May 19.

Mr. Symes said he was qualified to discuss this subject because he is not an engineer himself, a fact, he said, "that has been one of the principal regrets of my life, because our whole industry—its inception, its growth and its development—has been built around good engineering."

To impress his listeners with "the importance of engineering on the railroad with which I am associated," Mr. Symes pointed out that there are 1,130 graduate engineers working on the Pennsylvania at present, 848 of them civil, 170 electrical and 112 mechanical. "We attempt," he added, "to bring into our organization about 60 graduate engineers each year. During the past few years, we have taken in 178 of them, and these were recruited from 52 different colleges and universities scattered throughout the country. You will be interested in knowing that the Pennsylvania has had 12 presidents since its beginning over 100 years ago, and seven of these presidents were engineers, six civil and one mechanical." Over the years the engineering graduates employed by the Pennsylvania have run about 75 per cent civil, 15 per cent electrical, and 10 per cent mechanical.

Nucleus of Organization

These engineering graduates, said Mr. Symes, are the "cream of the crop" in the Pennsylvania's organization. "They are the nucleus of our officer organization. Most of our superintendents, general managers, vice-presidents —and as a matter of fact, a former comptroller, our treasurer, some of our personnel officers—and many of our purchasing and traffic officers—came up with an engineering background."

Reciting his experiences as a member of a college committee several years ago, Mr. Symes noted that he was appointed to the committee "principally because I was not an engineer." The members of the committee, he said, were mostly deans of engineering schools from some 15 or 18 colleges and universities. "I was somewhat amazed at the first few meetings I attended, to note the apparent shearing away from the railroad industry—as if we had the measles. I found that they were under the impression that the railroad industry had little to offer engineering graduates as compared with other industries."

Apparently, based on a guide of railway officers, the committee had "tried to equate opportunities and salaries" of the engineers employed by the railroads. "Admittedly," said Mr. Symes, "on the premise it looked rather bad, but upon my insistence that a real study and appraisal be made of what happens to engineers after they are employed in the industry, they changed their views materially."

Training Course for Engineers

The speaker then cited a hypothetical example of the application of a course of training to which young engineering graduates are subjected on the Pennsylvania. "Bill Smith is a promising young man who will graduate —let's say from Purdue this June—as a civil engineer. Our chief engineer of the western part of the railroad is in pretty close touch with Purdue and finds out that Bill is a promising young man, and has indicated that he likes railroading.

"The chief engineer gets in touch with Bill and explains to him what he would be up against if he did come into the railroad industry. He is not disillusioned in any way—he is told of the scattered and diversified jobs he is going to have to go through during the next three years; that he is not on a 40-hour week; that the railroad must operate 24 hours a day, every day in the year; that his assignment will involve irregular hours; that he will be subject to call at any time (nights, Saturdays, or Sundays); that he will be located here today and somewhere else tomorrow; that he will be required to spend time out on the railroad with track gangs and on rail trains; that he will be required to learn safety and operating rules, maintenance practices, signaling and interlocking operations, bridge work (how to build them and how to maintain them)." He is also told that he will have to learn how laboratory work is done by the engineer of tests, and that he will have to become familiar with correspondence and accounting at the divisional level and in the chief engineer's office.

No Limit to Progress

"Periodical progress reports are made on Bill by his supervisory officers," continued Mr. Symes, "and at the end of his training period we know—and I am sure Bill knows—if railroading is to be his life's work. If we both agree on that point, then there is no limit to where he can go in the organization—it is entirely up to him. This is a hard course of training for Bill, but actually he has

Young Engineers

come up the hard way which, after all, is the best way. This three-year training course develops and brings out in a practical way what these engineering students really learned in classes in school."

Explaining that the investment in road and equipment on the Pennsylvania is about $3 billion, Mr. Symes said that road takes in well over $1 billion in gross revenues annually and spends almost that much. A little over half a billion is spent for wages, and the balance for improving and maintaining the property, paying off debt, etc. During the post-war period the road has spent about $1 billion for actual improvements in the property —"and a large part of this expenditure was on borrowed money." "In maintaining a system of this size, I think you, as engineers," said Mr. Symes, "can visualize better than anyone else the diversity of our engineering problems . . . and the importance that you can play in the over-all picture."

J. M. Symes, executive vice-president, Pennsylvania Railroad

How the Pennsylvania Attracts Engineering Graduates

The Pennsylvania has been notably successful in attracting engineering graduates of high caliber into its service. This success is ascribed on the road to a number of factors. To begin with, starting salaries are offered which are comparable to those paid by other industries. Of equal or greater importance is the practice of putting successful applicants through a carefully planned course of training, with definite assurance of future advancement for those who demonstrate the required ability during the training period. As pointed out in the accompanying review of an address by the road's executive vice-president, J. M. Symes, the horizons of advancement for young engineers are not limited to the engineering and maintenance-of-way departments, but extend into the operating and executive departments as well. The record itself, as outlined by Mr. Symes, is evidence enough that the road prefers to man its higher and highest posts with technical personnel.

The PRR is not satisfied to establish these inducements for young engineers and then to wait for qualified applicants to come knocking at its door; it takes the initiative in seeking out and carrying its story to interested college seniors. As part of this effort the road has prepared an attractively printed and bound brochure of 24 pages entitled "Railroad Engineering—A Challenge and an Opportunity," in which it first points out the attractions and rewards of a career in railroading for young engineers. Nine pages in the brochure are then devoted to a graphical and verbal presentation of salient facts about the PRR and the importance of engineers to its success. The book goes on to outline each of the five courses of training offered for young engineers, three in maintenance of way and two in maintenance of equipment. The qualifications needed for a successful railroad career are then discussed, after which several pages are devoted to the answering of some of the more common questions that are likely to occur to engineering students contemplating a career in railroading.

Copies of the brochure are sent to a list of colleges and universities with the request that they be made available through the dean of engineering or the placement officer for examination by interested students. At an appropriate time prior to graduation each year each of these schools is visited by one of the road's regional chief engineers, M. W., with the purpose of conducting personal interviews with students who have expressed interest in the railroad's program. The student is thus given an opportunity to ask questions, while at the same time the railroad's representative can appraise the personal qualifications of the various applicants.

Other railroads have courses of training for engineering graduates and procedures for contacting qualified applicants, which are comparable to those of the Pennsylvania. Unquestionably there will be a continuing, and expanding, need for such programs if the railroads as a whole wish to be assured of an adequate influx into their ranks of qualified engineering talent.—Editor

THE CRANE at the left handles all of the rail in and around the yard. Old rails (foreground) are butt welded in the shack at the right and are pulled through the "assembly line" where excess weld metal is removed and weld areas are normalized

Crop, Weld, Saw...

Secondhand Rails for New Yard

In constructing a new hump classification yard at Allentown, Pa., the Central of Pennsylvania is welding secondhand rails into double or multiple lengths and sawing the latter into 78 or 75-ft. pieces. The purpose and advantage of this procedure, and the methods and equipment used, are described in this article.

• The Central of Pennsylvania is presently butt-welding a large quantity of secondhand 130-lb. RE and headfree rail for use in its new hump classification yard at Allentown, Pa. The secondhand rails used in this program are all in various stages of wear and include curve-worn rails, end-battered rails, etc. Much of the rail has little wear except end batter and fishing wear in the joint area.

Rails Grouped for Welding

The first step in preparing the secondhand rails for welding is to sort them into groups having similar section and degree and type of head wear. In this manner rails with full heads and rails with curve wear are kept separate to facilitate welding. It was originally thought that the curve-worn rails would be unsuitable for welding, but subsequent investigation has proved this reasoning to be incorrect.

After the rails are sorted with regard to section and head wear, each group is divided into two parts. The first group consists of full 39-ft. rails, and the second group is comprised of short rails, broken-end rails, and pieces of old continuous-welded rails. The 39-ft. rails, after having their ends cropped, are welded into 72-ft. lengths by means of single welds. Rails in the second group are welded into longer strings and then cut into 78-ft. or 75-ft. pieces. In cutting the long rails into pieces the objective is to make each cut a distance of at least 18 in. from the nearest weld. If possible the long rails are cut into 78-ft. lengths but if this means that a cut will be too close to a weld the pieces are cut so as to be 75 ft. long.

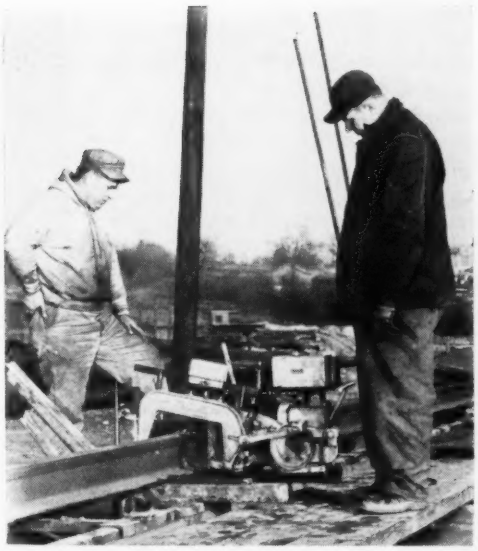
The welding is accomplished by the Oxweld pressure-welding process. The two rails to be joined are first cropped by a saw which cuts off the ends of both rails in one operation. With matched ends thus assured, the rails are butt-welded. After a normalizing treatment removes internal stresses, the rails pass on to the grinders where the excess weld metal is ground off, and thence to skids where the ends of the double-length rails are cropped and drilled and where the long strings are sawed into 78 or 75-ft. lengths. The ends of these latter lengths are also drilled. The rails are then stored for use as required.

All completed welds are inspected for flaws by the Magnaflux method. Whenever a faulty weld is discovered, the rail saw is run through the weld and the rail ends are rewelded.

Equipment Used

The welding operation is carried out using the familiar assembly-line technique employing a pressure-

THIS SAW crops the ends of two secondhand rails in one operation in order to assure that the ends to be welded will be perfectly matched



A RACINE POWER SAW is used to cut the rails into lengths of from 72 to 78 ft., after they are welded

welding machine, normalizing machine, rail saw and grinders—this equipment being furnished by the Oxweld Railroad Service Company, division of the Union Carbide & Carbon Corp. Additional equipment, owned and operated by the railroad, includes two Racine rail saws and two Nordberg rail drills, for cropping and drilling the ends of the welded rails, and a 20-ton Bay City carrier-mounted crane equipped with a 50-ft. boom for handling the rails around the yard. The crane operates on its own wheels when moving material about the yard but, when employed to string the long rails along the track, is run onto a gondola car by means of a special ramp maintained for the purpose. To facilitate handling of the rails, the crane is equipped with a 25-ft. bridle rail, to the center of which is attached the crane cable, and to the ends of which are attached rail tongs.

THE LONG RAILS, after they have been cut into desired lengths, have their ends drilled by this Nordberg rail drill on the storage racks at one end of the yard

Advantages Cited

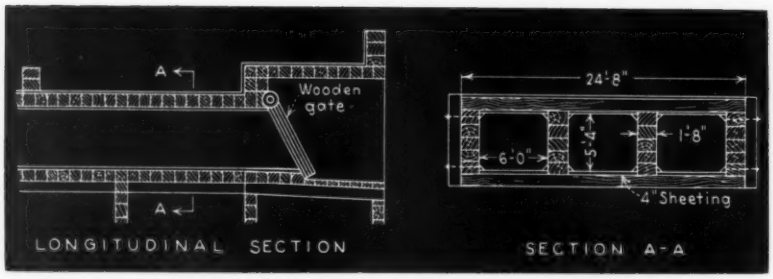
By welding and cropping the secondhand rail in the manner described a substantial reduction is accomplished in the number of bolted joints which must be maintained in the future. In addition, the railroad expects to gain added life for the old rails, since the worn fishing surfaces of the rails are removed when the ends are cropped, thus restoring full fishing contour in the joint-bar areas of the secondhand rails.

In addition to the secondhand rails being welded for use in the Allentown yard, several continuous lengths of new 131-lb. RE rail have been produced for use between insulated joints at the hump-retarder switches. The longest rail of this nature is approximately 700 ft. long, the majority being considerably shorter.

The Central of Pennsylvania has been using welded rail since 1938 and now has long rail installed in all filled-in station platforms in lengths up to 1,400 ft., and in highway crossings and on bridges. For the last 10 years 78-ft. rails, made by welding two new 39-ft. rails together, have been employed extensively in rail-renewal work on main-line track.

The Allentown project is under the general direction of S. L. Mapes, chief engineer, and C. H. Vogt, engineer maintenance of way. T. G. Reagen, track supervisor, is supervising the operation for the railroad, and Messrs. W. E. Campbell and L. W. Schietinger are representing the Oxweld Company at Allentown.

By G. W. Miller
Engineer Maintenance of Way
Canadian Pacific
Toronto, Ont.



THE OLD ABOITEAU, as shown in this drawing, was constructed of heavy timber and employed wooden gates which were hung on huge trunions mounted in bronze bushings

Canadian Pacific... Solves High Tide

• When, in 1912, the Canadian Pacific acquired the Dominion Atlantic Railway, it inherited some extremely difficult drainage problems foremost among which was the maintenance of an aboiteau (pronounced "a-bwa-toe") located at mile 38.17 on the Halifax subdivision at Hantsport, Nova Scotia. The original aboiteau, which by definition consists of a dike containing one or more sluices having "flap gates" at their ends, was built over 100 years ago for the purpose of preventing the abnormally high tides of the adjacent Bay of Fundy from backing up into the Halfway river and flooding more than 160 acres of fertile land which lies beneath the 30 to 35-ft. high-tide elevation. Subsequently, the original timber aboiteau was replaced by a similar structure. In 1951 it was found that the deteriorated condition of the timber aboiteau then in use threatened not only the railroad which ran over it, but likewise the adjoining farm lands. The manner in which the railroad, with the assistance of Armco Drainage & Metal Products of Canada, Ltd., solved the problem of rehabilitating the Hantsport aboiteau is a tribute to modern engineering methods and materials.

Original Installation

At Hantsport, the Halfway river drains an area of approximately 30 square miles and empties into the estuary of the Avon river and the Minas basin, an arm of the Bay of Fundy. Over 100 years ago, in an effort to reclaim the fertile farm land below the high-tide elevation, the owners of the adjacent farms built a dike across the mouth of the Halfway river. To permit the river to flow into the sea, they built in the dike a four-compartment timber culvert, or sluice, which had a total cross sectional area of approximately 77 sq. ft. To keep the high tides from flowing in through the sluice, they hung wooden doors or "flap gates" in each compartment. This complete timber structure comprised the original Hantsport aboiteau.

When the Windsor & Annapolis Railway was built, joining the two towns from which it obtained its name, the railway company made an agreement with the owners of the Halfway River Marsh, which permitted them to carry the railroad over the dike at the river's mouth, on the condition that they would maintain the dike and the aboiteau in perpetuity. In 1894, the Dominion Atlantic Railway was formed and absorbed the Windsor & Annapolis. Consequently, in 1912, when the Canadian Pacific took over the Dominion Atlantic, the maintenance of the Hantsport aboiteau became that road's responsibility.

Second Aboiteau Constructed

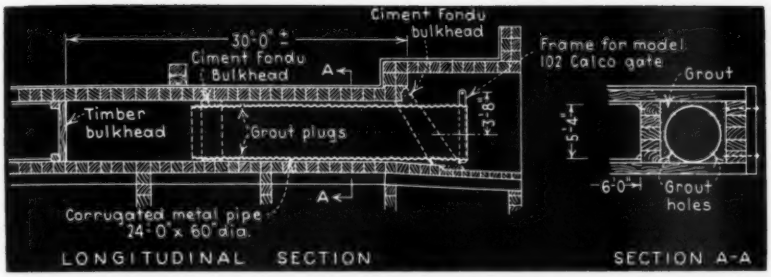
In 1910, the original aboiteau began to fail and in a short time washed out completely. Temporary bridgeworks had to be constructed across the river, and there were many times when the railroad was unable to operate because of high water. An attempt to buy up the marsh owners' property and construct a permanent bridge across the mouth of the river, thus allowing the marshlands to flood during high tide and eliminating the need for an aboiteau, was thwarted by the marsh owners' refusal to sell what was considered to be highly fertile potential farm land. Subsequently the decision was made by the railroad to build a second aboiteau.

The new structure was located approximately 200 yd. east of the original aboiteau. An attempt was made to build a concrete structure on a timber-pile foundation; however, during filling operations the new structure broke up due to foundation failure and subsequent differential settlement, with the result that the plan was abandoned in favor of a more flexible design.

A structure consisting of three compartments, each 6 ft. wide, 5 ft., 4 in. high and 232 ft. long, was constructed of 12-in. by 12-in. fir timbers. This timber sluice was founded on rock-filled timber cribs and was found to be sufficiently flexible to adjust itself to the differential settlement which resulted when the structure was loaded with fill. Timber gates, constructed of 6-in. hardwood, were supported from the top of each sluice by wooden trunions set in huge bronze bushings. The structure was completed in 1916 at a total cost of approximately $175,000.

Second Structure Fails

In the construction of the new timber aboiteau, no attempt had been made to seal the joints between the 12-by-12 timbers. Consequently, each time the tide rose, causing a head of as much as 35 ft. to be placed on the structure, water leaked through the joints. Conversely, when the tide receded, water leaked back through the joints in the opposite direction. Since the waters of the Bay of Fundy are quite muddy, the abrasive action of the water eroded the joint faces until some of them were opened 3 in. or more. In addition, the constant passage of water through the joints depleted the fines in the fill material outside the structure, causing the fill to become porous. If the situation had been allowed to continue, it can easily be seen that a zone of porous fill could have been created around the entire structure. Water leaking through the embankment outside the structure



THE RENOVATION of the structure was accomplished by threading large-diameter corrugated pipe through the timber aboiteau and filling the voids with a grout mixture

The highest tides in the world, found in the Bay of Fundy between Nova Scotia and New Brunswick, created quite a problem for the Canadian Pacific at a location where the railroad crosses the mouth of a river draining into the bay. The manner in which this particular problem was solved is a tribute to present-day engineering methods and materials.

"Headache"

NEW AUTOMATIC GATES replaced the wooden gates at the outlet end of the aboiteau structure to prevent the sea from backing up into the sluice during high tides

could then cause a washout of this second aboiteau.

In 1949, the Canadian Pacific invited engineers of Armco Drainage & Metal Products of Canada, Ltd., to inspect the structure and suggest methods for its repair. In October of the same year, F. S. Bolton and J. K. Young of the Armco company made their first inspection. Other inspections followed during the summer of 1950, after which a plan was drawn up and submitted to the railroad for approval. Later in the year a contract was awarded to the construction department of Armco to revamp the aboiteau completely by threading 60-in. diameter Armco asbestos-bonded pipe through the length of each compartment of the sluice. The outlet end of each pipe was to be fitted with an Armco Model 102 automatic water control gate.

Method of Construction

A timber bulkhead, designed to carry a 35-ft. head of water, was constructed in one of the timber compartments of the sluice about 30 ft. from the outlet end, and the heavy wood flap gate was removed. Then a 24-ft. length of 60-in. pipe, with a gate frame attached at one end, was inserted into the same end of the compartment and positioned so that the gate would function properly when the flap was installed. Bulkheads were then constructed between the outside of the pipe and the inside of the timber sluice compartment. These bulkheads were made of Ciment Fondu, an alumina cement imported from England, which sets up quickly and resists the action of salt water.

When the bulkheads were completed, a 3 to 1 grout mixture of sand and cement was pumped by a duplex grout pump to fill the space between the outside of the pipe and the inside of the timber sluice and the Ciment Fondu bulkheads. However, when the pouring was begun, it was found that the grout mixture leaked out through the cracks in the timber floor of the sluice as soon as it was pumped in. The top half of each bulkhead was then removed and a mixture of very stiff concrete was thrown in to a depth of approximately 1 ft. to seal the floor.

After rebuilding the bulkheads, the remaining space was quickly and easily pumped full with grout. After the concrete had set, the flap of the 60-in. diameter flap gate was hung in place on the gate frame at the outlet end of the pipe and the timber bulkhead was removed from behind the 24-ft. length of pipe within the timber sluice. After this procedure was completed on the other two sluice compartments, the aboiteau was again in operation with three new gates.

Three 16-ft. lengths of 60-in. pipe were then threaded into each compartment of the aboiteau from the upstream end and connected to the 24-ft. lengths which had been installed from the outlet end. After the floor of the timber sluice had been sealed off with a stiff concrete and Ciment Fondu bulkheads had been constructed, the voids were pumped full with grout as before. All leakage through the aboiteau at high tide was now sealed off.

Dam Constructed Upstream

All stages of the project, thus far, had been carried out during periods of low tide, allowing a maximum of 10 working hours per day. However, now that the aboiteau was sealed to prevent leakage, it was found advisable to build a small earth dam 100 yd. upstream from the aboiteau. This dam, containing two 30-in. diameter pipes equipped with lift gates, stored up

BULKHEADS WERE CONSTRUCTED at the ends of the pipe sections. Grout, pumped through holes in the pipes, filled the space between the pipe and the timber walls

AN INTERIOR VIEW, looking toward the outlet end of one compartment of the aboiteau, showing asphalt paving on the floor of the newly constructed pipe sluice

PRESSURE GROUTING equipment shown here handled approximately 4,500 bags of cement at a rate of 100 per hour when sufficient labor for mixing was available

the fresh water draining the Halfway River basin. Consequently, thereafter it was possible to carry on the work 24 hr. a day, since the site could now be kept completely dry.

The next phase of the project was to insert 150 ft. of pipe into each compartment and connect it to the pipe already in place. The shorter lengths making up each of these 150-ft sections were assembled with special match-punched bolted connections. All other connections were made with inside contracting coupling bands. After this pipe had been secured, the spaces between the pipes and the insides of the timber sluices were filled with grout.

A total of 694 ft. of 60-in. Armco ingot iron asbestos-bonded paved and asphalt-coated pipe was used on the project, along with approximately 4,500 bags of cement for grout fill. During the last stages of the grouting some 3,000 bags of cement were pumped by the 5½-in. by 5-in. by 2½-in. pump which, when sufficient labor for mixing was available, handled approximately 100 bags per hour.

Capacity Was Sufficient

During preliminary discussions it was thought that the waterway area would be considerably reduced by placing the 60-in. pipe inside the 72-in. by 64-in. timber boxes. It was concluded, however, that since the Armco automatic gates would operate on less head than did the old wooden gates, and since head loss would be considerably less in the corrugated pipe as compared with the timber compartments, the pipe installation would satisfactorily handle the required volume of water. It has since been shown that the repaired structure leaks no water to the upstream end of the aboiteau. In comparison, the old structure leaked enough water during high tide, with the gates closed, to sometimes raise the river level by as much as 12 ft.

The complete rehabilitation project took three months and was covered by a firm lump sum contract. The Canadian Pacific supplied all sand, cement and timber, as well as a building for storage. Total cost was less than $75,000. The project was under the supervision of F. S. Bolton, manager of construction for Armco. Superintendent on the job was G. H. Kearns. W. F. Pratt served as assistant superintendent for the contractor.

Steam Generator Car Has Many Uses

THE GENERATOR CAR furnishes the steam necessary to drive piles for this bridge near the road's Proviso yards

Mounting a flash-type steam generator, automatic controls and other related equipment on an old locomotive tender, the C&NW has produced a versatile unit that can be employed to meet various needs, such as supplying steam for driving piles, where a quick supply of steam is desired.

• A mobile power plant has been made available on the Chicago & North Western for use in any situation where a need develops for a primary or supplementary source of steam. Although the new unit will have a variety of applications, it is expected that it will be widely used by the bridge forces as a source of steam for driving piles. To produce this mobile plant, the railroad converted an old locomotive tender to a steam-generator car at its Chicago shops by fitting it with a flash-type steam generator, a diesel-electric generator, and air compressor, fuel and water storage tanks, and other related equipment.

The result of this conversion is a versatile mobile unit, termed Steam Generator Car No. 150, that can be used in many ways. Among the more important of these, at least from the standpoint of maintenance-of-way departments, is the use of the unit as a source of steam for driving the hammers of pile-driving outfits, as well as for propelling these rigs.

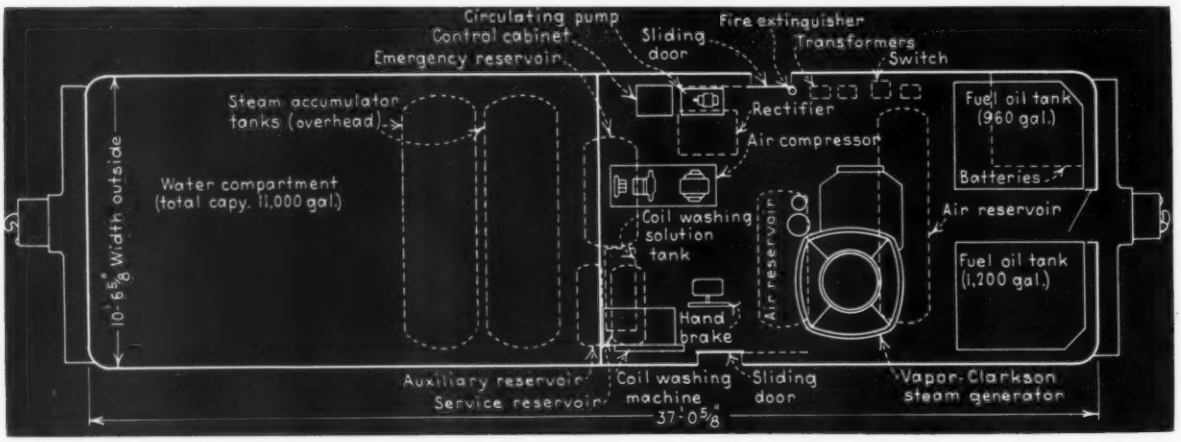
In winter, it may be used to augment the steam plants of passenger diesel units hauling and heating 18-car trains, or to supply the steam for heating passenger trains hauled by freight diesels. It can also be used to heat or cool cars of convention trains or of other special trains parked on sidings. Another possible use is as an emergency source of steam when a boiler in a power plant breaks down or when a heating plant in a station must be shut down for repairs, because the car can be quickly moved to fill such a need. Still another practical use to which the steam generator car may be put is that of supplying steam to wrecker cranes and related equipment.

Description of Unit

The tender was formerly used with one of the North Western's heavy-duty Class "H" steam locomotives—a class that is now being decommissioned as the road becomes more highly dieselized. Parts at the forward end of the tank were cut away to form a room with side doors for housing the new steam generator equipment.

Near the center of this room (see floor plan) an automatic Vapor-Clarkson Model 4635 steam generator was installed. This is the same type of generator that is used on passenger-train diesels for supplying

NORTH WESTERN'S Steam Generator Car No. 150 was made by mounting a flash-type steam generator and related equipment on a revamped old locomotive tender. The car also has an air compressor to operate a small air hammer or other small tools



GENERAL LAYOUT of the equipment mounted on Steam Generator Car No. 150 is shown in this sketch. Note the compact arrangement whereby all available space is utilized to the best advantage yet retaining complete accessibility to all component units

steam for heating the cars. This machine produces from 1,000 to 3,500 lb. of steam per hour at 75 to 300-lb pressure, which is sufficient to operate a large double-acting pile-driving hammer or to heat a train of average length. In two minutes this machine will develop 200 lb. of steam pressure from cold water. Once started, automatic controls cause the steam generating machine to produce steam only at those times when it is needed and in the amounts required.

Large Capacity Fuel Tanks

Two fuel tanks, having a total capacity of 2,160 gal., were installed at one end of the room and a Worthington two-stage air compressor, driven by a 10-hp. electric motor, was mounted near the other end. The compressor supplies sufficient compressed air to operate a small air hammer and for atomizing the fuel required by the steam generator. It can also be used to drive air saws and other air tools, as well as for operating the brakes of work trains. Brackets were fastened underneath the tender frame to carry a 25-kw. Waukesha diesel-electric generator for making current (220/440 volts, ac.) to drive a 5-hp. motor on the steam generator as well as the one on the air compressor, and for train lighting.

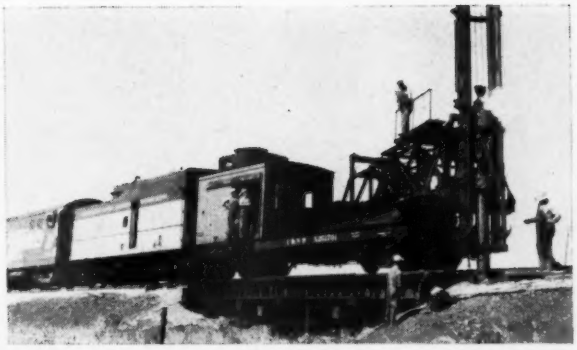
Two insulated steam accumulators, of 66 cu. ft. capacity at 300 psi., are mounted on the top of the rear half of the car. These accumulators serve to smooth steam-hammer operation when driving piles. They have steam traps for returning the hot condensate to the water supply tank and for keeping the accumulators full of steam and at the same time eliminating the possibility of waterlogging.

Can Work for Long Periods

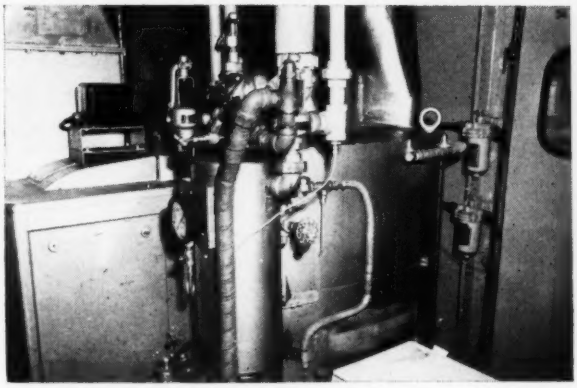
The rear half of the steam generator car is the water storage tank, which holds 11,000 gal. This sizable supply, together with the 2,160 gal. of diesel fuel oil, permit this car to be used on pile-driving work for 10 days or more without refueling or taking on more water. This feature is expected to expedite construction work by eliminating frequent time-consuming trips for fuel and water as was necessary with outfits equipped with steam boilers.

The fuel capacity of this car will also be used to good advantage when it is used with a diesel freight locomotive to heat passenger cars, as this car will be able to heat a train en route from Chicago to the west coast in mild weather without having to stop to be refueled along the way.

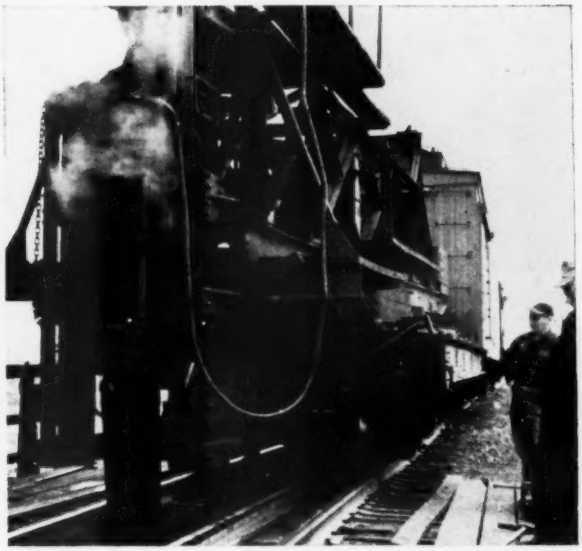
THE AIR COMPRESSOR in the North Western's new steam generator car is powered by the 10-hp., 200-volt ac. motor shown here



ANOTHER VIEW showing the generator-car unit employed in supplying steam for the driving of piles on a typical bridge job



VAPOR-CLARKSON steam generator installed in the generator car is same as those used on diesel locomotives for car heating



STEAM at 200 p.s.i., furnished by the generator car, powers this hammer driving a 55-ft. pile at 115 strokes per minute

The steam generator also has special automatic "stand-by" keep-warm controls, which cause the generator to fire up every four or five hours and operate for about 15 min. when idle in winter, thereby keeping the fuel and water warm in the tanks and eliminating the need for draining the coils.

A water-treatment tank was installed next to the steam generator because, while treated water will be used when available, it may be necessary to use untreated water from streams at times. A complete coil-washout pump and tank were also placed in the car so that the coils may be properly serviced after the car has been out of service for any reason for any considerable length of time.

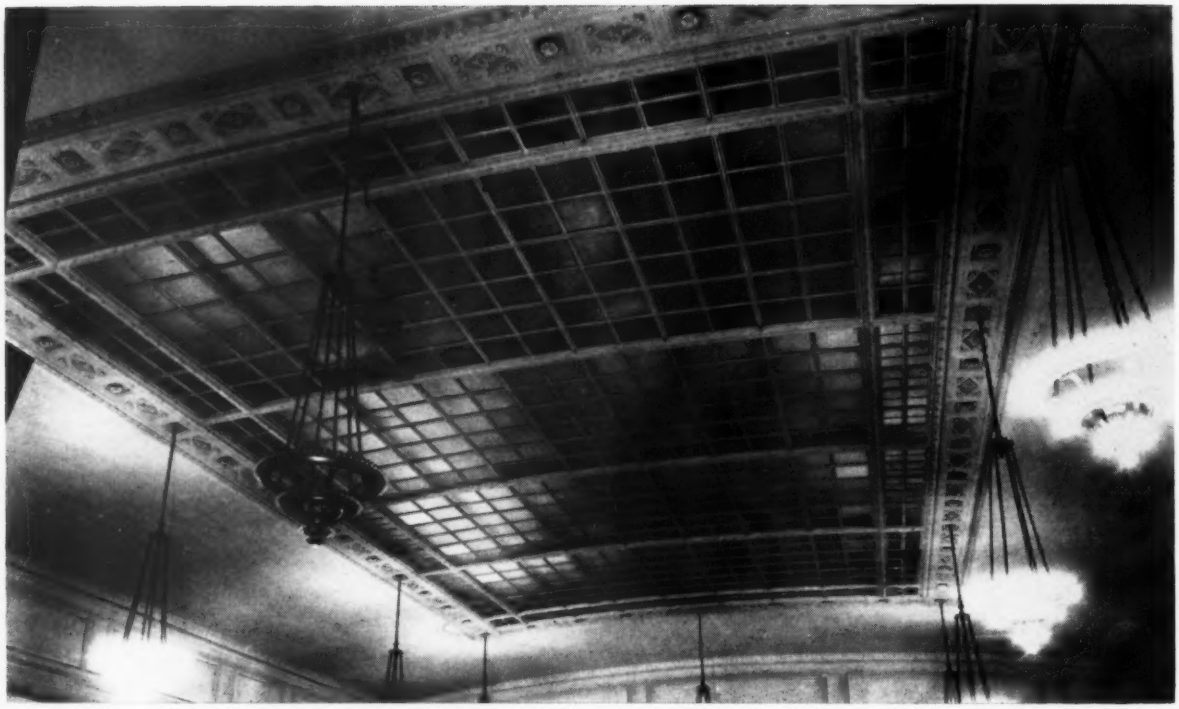
First Pile-Driving Job

The first pile-driving job on which Steam Generator Car No. 150 was employed involved the redriving and renewal of the pile trestle approach spans to a single-track steel through-girder span extending over the two main tracks of the North Western's Galena division near the east end of the road's large Proviso yards near Chicago. This operation required the driving of a total of 47 creosoted piles ranging from 36 to 55 ft. in overall length.

While it would have been possible to use the generator car for propelling the pile-driving rig to and from the bridge by means of a steam engine on the rig, either a diesel switcher or a yard steam locomotive was used for this purpose. The track on the overpass was a busy one with the result that there were many interruptions to the work so that it was spread over a period of two weeks. During this period, however, it was not necessary once to refuel the car, since the car's fuel carrying capacity was quite sufficient.

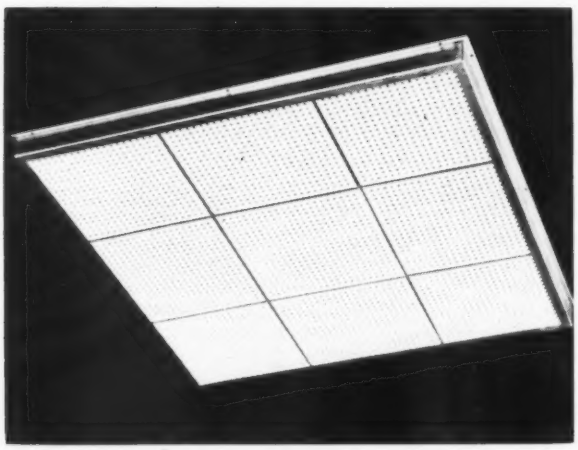
Controls on the steam generator were set to produce 200 lb. of steam pressure for operating the double-acting steam hammer. This pressure was sufficient to produce 115 hammer strokes a minute. Steam was produced only as needed by the hammer or for the hoisting line because the automatic controls regulated the firing of the generator.

The performance of Steam Generator Car No. 150 on this and another pile-driving job near Peoria, Ill., on a line operated entirely with diesel power, has proved satisfactory. The car was also used satisfactorily in an experimental way to heat a suburban train from the rear end when it was hauled by a diesel locomotive. A second steam generator car, which will be similar in design to Car No. 158, is now under construction at the railroad's shops at Chicago.



REVERBERATIONS of sound coming over the public-address system in the main concourse of the Cleveland Union Terminal were caused largely by this skylight of 504 glass panels. It was consequently decided to cover skylight with acoustical tiles

Acoustical Tile Does It . . .



ACOUSTICAL TILES, fastened by concealed screws to a plywood backing, formed panels which were framed with 16-gauge metal and attached to the iron skylight mullions by machine screws

Echoes Quieted In Large Station

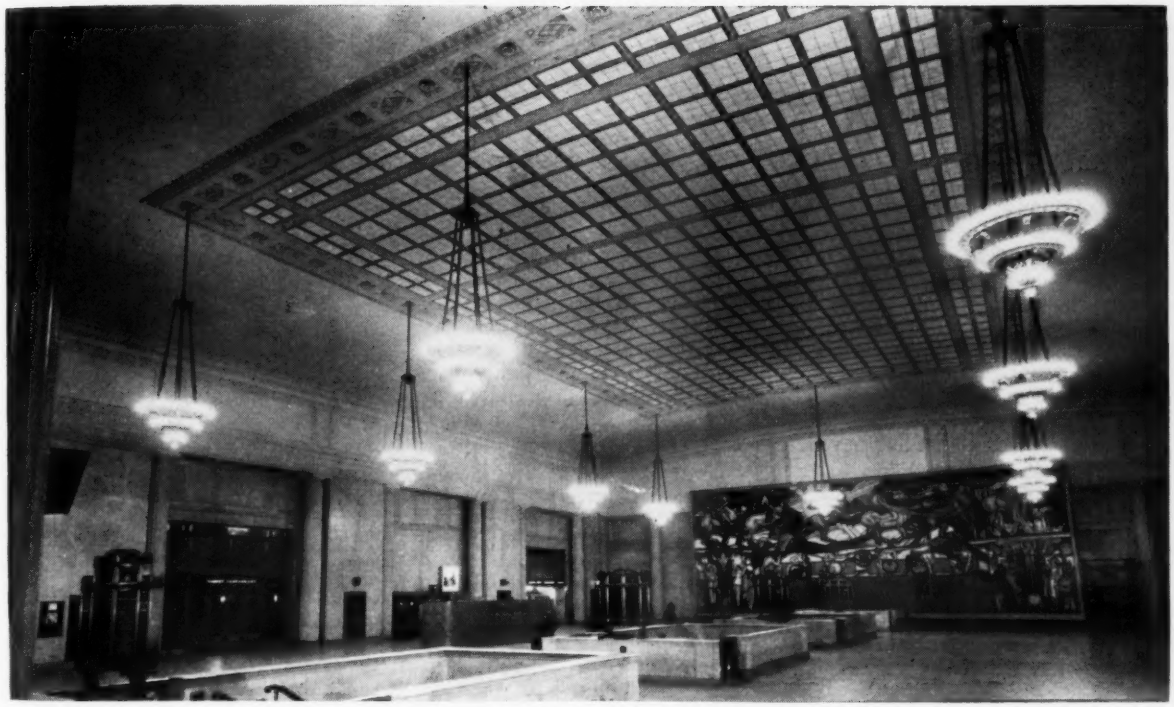
Announcements made over the public-address system in the main concourse of the union terminal at Cleveland, Ohio, were distorted because of sound reverberations from the walls and ceiling. However, when acoustical tile was applied directly underneath a huge overhead glass skylight in this room, there was such a marked improvement that no further treatment was necessary.

• Frequently in the past, patrons using the main concourse of the Cleveland Union Terminal found it difficult to understand what the announcer was saying over the station's public-address system. His announcements were distorted and confused by the sounds reverberating from the walls and ceiling. An increase in amplification did not correct this trouble.

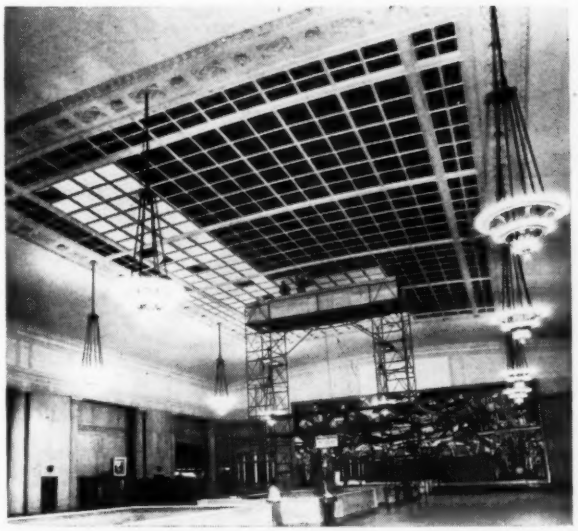
The reverberations were brought about by the highly reflective building materials used in this room which caused the sounds to bounce back and forth across the room several times before becoming inaudible. This rebounding caused distortion of the voice sounds coming over the address system because echoes would reach the ear shortly after the original speech.

Modern Technique Employed

The problem was not a new one but the manner in which it was solved is a demonstration of the use of modern acoustical technique. There were two factors



WHEN THIS WORK was completed, a total of 3,744 accoustical tiles had been applied, resulting in such a marked improvement of the clarity of the announcements over the public address system that no further treatment was made in this room



A SPECIAL SCAFFOLD was erected of tubular sections to facilitate the fastening of the accoustical panels to the skylight

to be considered in correcting the poor accoustics of this large station. First, it was necessary to determine how much and what type of accoustical material to use to bring about the proper results. The second factor was how to install the accoustical material and where to place it. Both of these questions were solved by the George P. Little Company, Inc., Cleveland, Ohio, accoustical engineers and contractors, who were called upon by the Cleveland Union Terminal to correct this condition.

Directly overhead in the main terminal concourse was a huge skylight with glass panels. It was determined that if tile were placed in these panels it would provide at least part of the accoustical correction needed. It was recommended, however, that it would be necessary to install additional material in order to secure the best results.

There were 504 panels of glass in the skylight consisting of 336 full-sized panels, 152 half-sized panels and 16 quarter-sized panels—all held in place by iron mullions. It was decided to leave the glass panels in place and to apply the accoustical tile beneath them. This was accomplished by mounting nine tile (for a full-sized panel) to a backing of plywood by means of concealed screws, building a frame of 16-gauge metal around the panel (see illustration on opposite page) and anchoring this accoustical panel with machine screws to the iron mullions of the skylight.

For the 504 metal-frame tile panels used in the ceiling treatment, 3,744 accoustical tiles were used, covering a total area of approximately 4,000 sq. ft. The accoustical tiles which were installed had a sound absorption coefficient of .99 at 512 cycles.

Tape Recordings Made

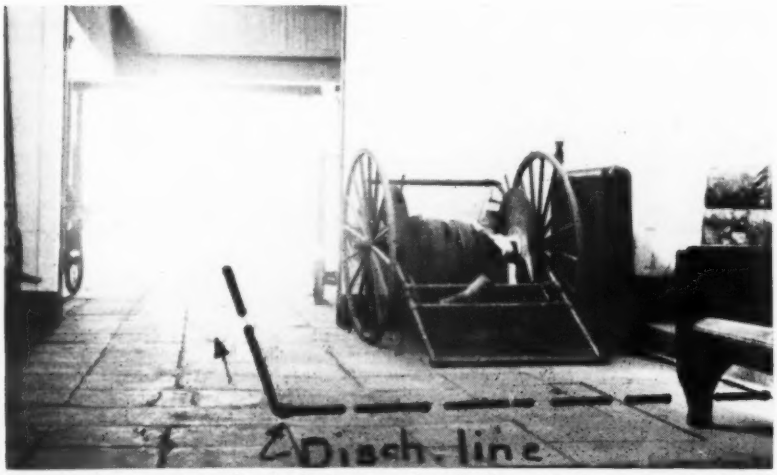
To properly judge the results of this work, tape recordings of speech announcements in the terminal were made before and after the tile was installed. Although it was realized that reverberations would not be reduced to the optimum level by installing accoustical materials only on that part of the ceiling taken up by the skylight, the improvement in the clarity and intelligibility of speech over the public-address system has shown such a marked improvement that no additional correction of the accoustics in the station is contemplated at the present time.

Find Many Uses for Photograph Albums of

• Realizing the difficulty of trying to remember details of the water stations on a railroad system over 6,500 miles in length, and because plats of station grounds are frequently unreliable in that they often show buildings, fences and other physical property that no longer exist, H. M. Schudlich, upon becoming engineer of water service on the Northern Pacific in 1947, decided to acquire a photographic record of every water station on his road. Always taking a camera with him on road trips, Mr. Schudlich has now accomplished his purpose and, by taking pictures both before and after any work is done, has established a record system that is up to date.

Among the more than 200 water stations to maintain on the Northern Pacific, there are always some which are under consideration for repair, improvement, or retirement. When such work is being considered various questions regarding the existing facilities often arise, many of which can be quickly answered by referring to the pictures filed in photographic albums. Among the information that can be determined from these albums is the general type of construction of a water station, the relative height of a tank, whether it sets on a concrete foundation or on wood or steel posts, and whether wood or steel beams were employed in its construction.

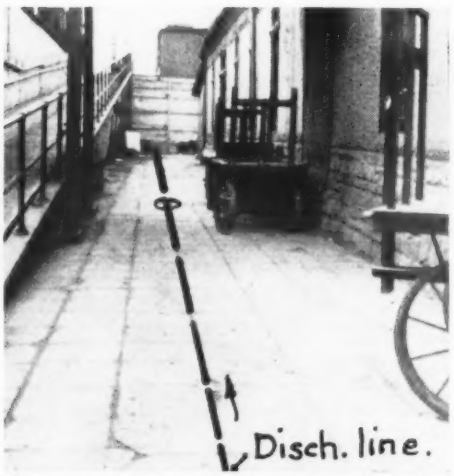
The pictures also reveal similar information on the pumphouses and other related structures. They also will show the relative proximity of the plant to the tracks, fences and other physical property, and whether or not: (a) a water tank has a spout on one side or on each side; (b) the tracks are served by water columns, and the kind of columns; (c) extra foundation posts have been installed for reinforce-



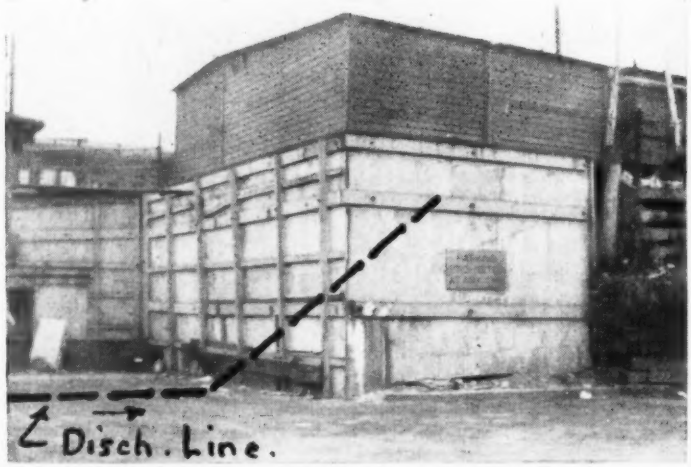
1 In developing a route for the hydrant service pipeline at Spokane, it was decided to bring the pipe from a connection in the depot basement along and . . .

Example of Use of Photographs

As explained more fully in the text, these illustrations show how the route for a pipeline, needed at Spokane, Wash., to supply a diesel watering hydrant, was first sketched on photographs. These pictures were then sent back to the office where they were employed in conjunction with the station plat in the preparation of detailed construction plans. In this manner, Mr. Schudlich, engineer of water service on the Northern Pacific, was able to go on about his business at other points along the line while the plans were being prepared and the material ordered for the construction. Considerable time was saved and more detail was supplied to the office than would have been possible with conventional sketches and reports.



2 Under the depot's lower platform, allowing it to extend onward until it reached a . . .



3 Retaining wall which supported the fill for a coach yard. The line was then to pierce the wall and incline upward to a plane below . . .

Water Stations

For a number of years the engineer of water service of the Northern Pacific has followed the practice of taking photographs of all water service installations before and after any alteration or reconstruction work is done. Today, he has photographic albums with a complete record of those facilities, which has proved extremely helpful on many occasions.

ment; (d) the station is situated on an outcrop of rock; (e) the pumphouse has an A-frame; and (f) the plant is served by an electrc power line or can be conveniently served from a nearby established line if necessary.

Some pictures show the wells, and others a view of the pump pits. Pipe lines appear in still other views. Some pictures show the source of the water, such as a river, lake or reservoir, as well as the intake and pipe lines which convey the water from the source to the delivery point.

To facilitate locating them the photographs are filed in alphabetical order in the albums by the names of towns. Some stations may be represented only by two pictures, while others, depending upon the size of the station and the amount of work that may have been done at that point, will be represented by several photographs. Frequently, these albums will be referred to by men of other departments on the chance that they will also show some subject other than the water station equipment in which they have a current interest.

Photographs in Lieu of Sketches

Another use made of the photographs by Schudlich is as a substitute for sketches. One instance of this use was in connection with the installation of pipe line and hydrant for an urgently needed diesel-watering facility at Spokane, Wash. At this point the station tracks are elevated above the ground and the depot is at ground level. After an examination of the premises, Mr. Schudlich determined the best way that this could be done. By bringing a pipe line from a connection in the depot basement and having it follow along and under the depot's lower platform as far as a retaining wall which supported the fill for a coach yard, then having it pierce the wall and incline upward to a plane below the upper station platforms, the line could be installed to supply a water service hydrant at this level.

Line Sketched In

After taking a series of photographs of the route and getting the pictures developed, Mr. Schudlich sketched in the proposed line in ink on the prints. These were then mailed directly to his office in St. Paul where the views were used in conjunction with the plat of the station grounds to prepare detail plans. This work was done and the material ordered, while Mr. Schudlich went about his other business without having to return to his home office. This method saved him time, and the photographs showed more detail to the home office than could be covered by the conventional method of drawing sketches and writing a report.

Another instance concerned the disposal of waste oil at Centralia, Wash., where the waste oil was pumped into an old engine tender in which it was hauled to and unloaded at three burning pits. The problem was to eliminate this inconvenient method of disposal. Again taking photographic views along the route, it was shown that it would be feasible to lay a pipe line to handle this waste. These views also showed that what appeared to be a more direct route was impracticable because of the presence of a highway.

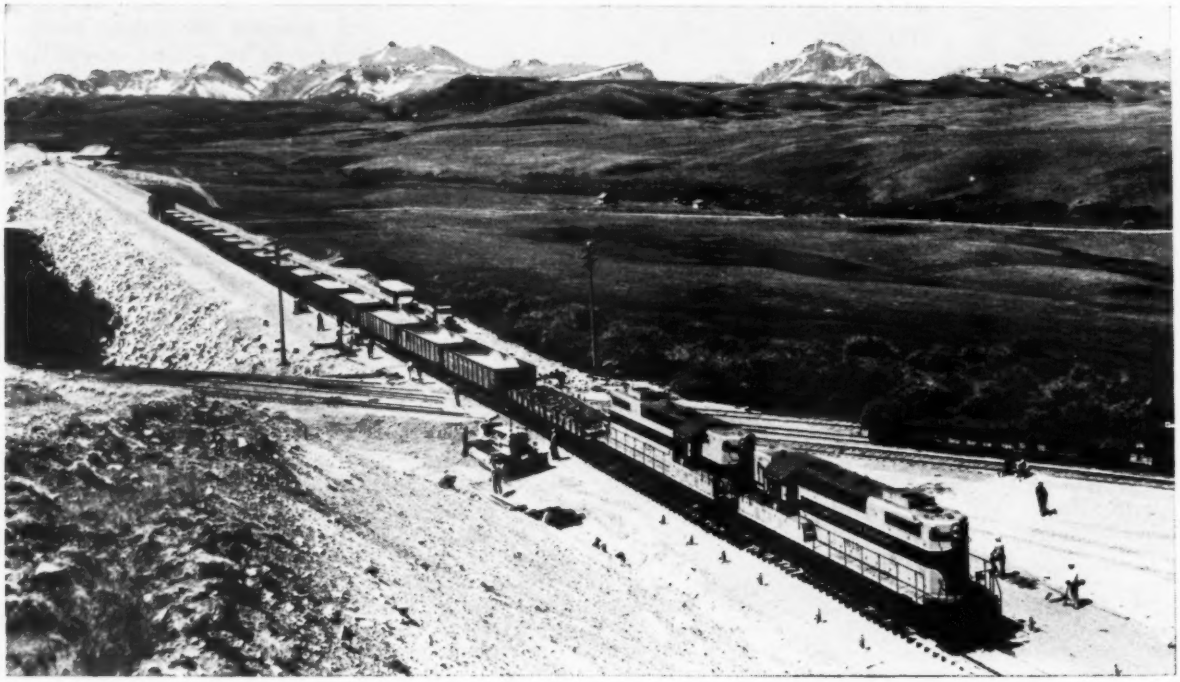
Pipe Line Photos Also Used

Pictures of pipe lines have also been used to good advantage. At South Tacoma, Wash., there was a power plant more than 50 years old. It became necessary to rebuild the pump pit and replace the pipe lines. It was found that so many changes had been made to the pipe lines since the original installation that the available plans were far from being in accordance with actual conditions. Pictures were taken from four directions of the seven pumps and the related piping in the pit. These were used for laying out the new system while at the same time permitting temporary connections to be made for maintaining service during reconstruction.

The use of photographs has proved so helpful to Mr. Schudlich in his work that he would now be quite lost without his albums. The albums are of looseleaf style so that expansion can be made without rearranging the set. Other departments on this road have now accepted this plan and similar albums on buildings and bridges have been started.

4 The upper station platforms. On this level, the pipeline was to be continued through the yard to the location of the desired new diesel watering hydrant

News Briefs in Pictures . . .



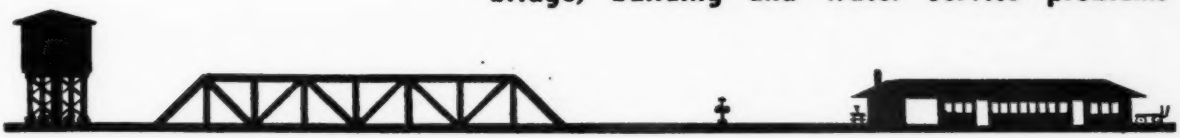
▲ **THE GREAT NORTHERN** recently completed the realinement of 3½ miles of main line (a portion of which is shown above) on the east slope of the Rocky Mountains in Montana. The project, which cost an estimated $1,000,000, was begun in 1951 in an effort to reduce excessive curvature. The work train in the photo above is unloading crushed granite ballast from the road's quarry at Essex, Mont.

◀ **THE FRISCO'S** new office building-freighthouse, recently opened at Ft. Worth, Tex., houses the operating and general offices of the Frisco lines in Texas in the two-story, 125-ft. long section at the right, while containing complete freight station facilities in the 151-ft. long section at the left. Heat exchange units in the building use chilled water during the summer months

RAILS ARE DRAGGED into position by ➔ a Caterpillar tractor following a recent 16-car derailment on the Rock Island between Chicago and Peoria, Ill. Three tractors were employed on the job which involved the clearing of debris and the removal of wrecked cars from the right of way. Although hampered by the fact that some of the cars were loaded with explosives, the three tractors, equipped with bulldozers, had the area cleared in less than 17 hours after the derailment. Sand, empty beer bottles, and a variety of other freight had been loaded on the cars which derailed, all of which had to be removed before any work could be begun on restoring the track to service. The derailment broke a 64-car train almost exactly in the middle. Twenty-two cars ahead of the pile-up were brought on to Peoria, while the 26 cars behind the wreckage were pulled back to Chillicothe, Ill.

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Rigid-Frame Railway Buildings

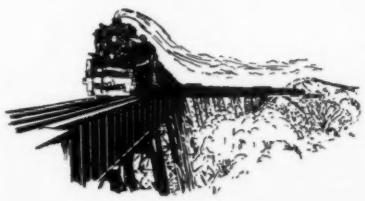
What are the advantages and disadvantages of rigid-frame construction in railway building? Under what conditions or for what types of buildings is it applicable? Explain.

Ideal for Certain Needs

By GEORGE M. POST
Architect, Spokane, Portland & Seattle, Portland, Ore.

When we decided to replace a wood-frame, obsolete, rip-track shelter covering only two tracks, the design of structure was obvious. It was proposed to cover four parallel tracks in the shortest possible time and still carry on the repair work. The first consideration was given to a built-up laminated-wood, rigid-frame structure. Later, the structural material was changed to steel at very little additional cost. The selection of the rigid frame was determined by its low eave line and necessary height where it was required. Use of the traditional type of clear-span, horizontal-chord trusses would have necessitated a much higher structure to allow workers to work on top of box cars with clear headroom.

Our railroad forces constructed all footings and column pedestals. Erection of the superstructure started on October 22, 1951, and was substantially complete by December 11. A contractor agreed to furnish all materials, including steel frames, purlins, and roof covering. The building was designed for two sections, each covering two tracks on 24-ft. centers. One section has frames of 50-ft. span and is 870 ft. long. The other section has similar frames and is 612 ft. long. Double columns only five inches apart join the sections, with a separation of only five inches. Only one section of the building, measuring 40 ft. by 50 ft., was partially enclosed—for blacksmith operations.*



Other railroad structures which might utilize the rigid-frame construction include stores, buildings, warehouses, freighthouses, machine shops, coach shops, foundries, welding shops, and automotive and maintenance repair shops. The rigid-frame type of structure is particularly adaptable where rolling stock is to be brought into the building.

For enclosed buildings there are numerous methods of wall construction easily built. Insulated enclosing walls and roof can readily be obtained. Daylighting can be accomplished in side walls by installation of steel sash or translucent plastic sheets in side walls and roof. Extended roof canopies can be furnished with an overhang of as much as 12 ft.

Rigid-frame buildings can be assembled in almost limitless sizes and arrangements. Seldom are any two requirements exactly alike, yet the versatility of this type of design meets practically all needs. The fact that this type of structure is prefabricated by many companies makes it readily available and very economical.

The advantages of rigid-frame buildings include more clear space of which every square foot can be used, low eave lines, ease with which additional units can be added economically, low insurance rates for steel structures, and the fact that standard buildings of a variety of sizes are quickly available for urgent construction. At present I see no disadvantage for rigid-frame construction for certain classes of building mentioned above.

* For a complete description of this building see *Railway Age*, March 24, 1952, p. 36.

Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the November Issue

1. What is the simplest, the most convenient and most effective method of bonding rigid frogs so they will carry signal current? Spring frogs? Explain.

2. What are the advantages and disadvantages of establishing standard colors and color schemes for painting passenger stations? Explain.

3. To what extent, if any, might complete dieselization alter the economics of the use of heavy rail? Explain.

4. When a single-track concrete ballast-deck bridge begins to deteriorate badly, how can repairs be made effectively under traffic?

5. Should roadway machines and M/W work equipment be repaired in shops under the jurisdiction of the mechanical or maintenance departments? Why?

6. Under what conditions, if any, can plastic pipe be used by railways for water lines? For fuel oil lines? What are the advantages and disadvantages in such use? Explain.

Where to Place Switch Stands

On main tracks what factors determine on which side of the track switch stands should be placed? In yards? Explain.

Place on Turnout Side

By Section Foreman

Essentially a switch stand is a mechanical device by which the switch points are both held securely in place and moved so that trains can be diverted from one track to another. On most switch stands there is a "target" which indicates whether the switch is open for movements off the main line or closed for main-line passage. This switch target was put there for one reason only—so that enginemen or train crews can observe how the switch is set as they approach. Hence, the target must be placed where it can be plainly seen from an approaching train.

All stands connected to main-track switches should be located on the turnout side or the closed-point side because that keeps the throw rod in tension when the switch is lined for the main track. This location is also more convenient for the trainmen.

In yards, the same rule should apply wherever possible. For convenience, however, all switch stands on ladder tracks are placed on the ladder side.

Keep Throw Rod in Tension

By Engineer Maintenance of Way

Main-track switch stands should be placed on the turnout side of the track so that the throw rod is in tension when the switch is set for main-track use. Were the stand to be placed so that the throw rod would be in compression when the switch is "closed", a careless trainman could hurriedly close the switch with a small obstruction between the point and stock rail and lock the stand because the rod would bow or bend. The force required to do this would fool the trainmen into thinking the points were tight against the stock rail. If he hurried off without checking, he would leave the switch point gapping in an unsafe condition. This could not happen with switch rod in tension because the stand could not be latched with an obstruction in the point opening.

At trailing switches on double tracks, this system places the target, or lamp, on the left side of facing movements in violation of generally accepted practices. This condition can be corrected by installing a "lamp stand" between the tracks and connecting it to the switch by a rod. In making this type of installation it is preferable to place the lamp stand on a post buried in the center ditch rather than on a long tie. The latter method, although frequently employed, is objectionable because the tie obstructs ballast cleaning machines and vibrates under traffic enough sometimes to extinguish the kerosene switch light.

Cooling-Water Corrosion Inhibitors

In the event of a shortage of chromates, what alternate types of corrosion inhibitors are suitable for use in conditioning water for diesel locomotive cooling systems? What are their advantages and disadvantages? Explain.

Alkaline Chromates Are Best

By M. A. Hanson

Engineer of Research, Gulf, Mobile & Ohio, Bloomington, Ill.

As far as is known to this writer no alternate corrosion inhibitor has been developed which is as effective in diesel cooling systems as the customarily used alkaline chromates.

One proprietary compound, containing approximately three per cent sodium nitrite, 10 per cent trisodium phosphate and the remainder borax, has been given limited field testing. One test was conducted for five months in an Alco 1000-hp. switch engine and another for 10 months in two E.M.D. F-7 units. These tests indicated that this compound was considerably less effective as a corrosion inhibitor and its concentration was more critical than that of alkaline chromates.

An attempt was made to maintain a concentration of 0.75 oz. per gal. of inhibitor by weekly control tests and by the manual addition of chemicals as indicated by those tests.

This is the only alternate corrosion inhibitor which, to our knowledge, has shown sufficient merit to justify field testing. Although it is not as effective as desired, it does offer a considerable degree of protection. The use of a product of this type should be of substantial benefit if chromates were not available.

Substitutes Being Sought

By T. A. Tennyson, Jr.

Chief Chemist, St. Louis Southwestern Mt. Pleasant, Tex.

From both the points of toxicity and possible scarcity it would be desirable to find some material which could take the place of alkaline chromates in the treatment of diesel cooling water. For that reason this subject has been studied by the American Railway Engineering Association as well as by water chemists all over the country. Some combinations of materials have been tried with questionable success and some with no success.

Alkaline chromates have the ability to inhibit various metals against attack and the diesel-engine cooling system needs just this sort of material. The problem is one involving dissimiliar metal couples and water is constantly being exposed to oxygen, variable temperatures and very high flow rates.

Alkaline chromates are easy to determine quantitatively and the amounts for effective inhibition do not appear to be critical. This has been one point of failure of some of the other materials tried. With alkaline chromates it is possible to tell quickly and accurately how much of the material is present but not so with the other compounds. For an inhibitor to be of maximum value to the railroads it must have a wide range of effective concentration and the amount must be easily determined. Also the inhibitor should not deteriorate or be consumed at a rapid rate in use.

Use of Portable Bituminous Mixers

Under what conditions are railroad-owned portable bituminous mixers desirable for use in patching or renewing highway grade crossings? What economies might result? Should the mixer be spotted at the job site or elsewhere? Why?

Mixers Put It Where Needed

By J. E. CHADWICK
Kwik-Mix Company, Subsidiary of Koehring Company, Port Washington, Wis.

The public demands a smooth-riding crossing, and pedestrians want one that is smooth enough to eliminate the hazards in tripping or turning of ankles in "pot holes". To have such smoothness all bituminous surfaces must be regularly maintained. A bituminous surface cannot be constructed and then forgotten. "Preventive" maintenance is, of course, the best policy to adopt, and if practiced, a bituminous surface will prove to have a very long life and be satisfactory. "Corrective" maintenance is necessary when "preventive" maintenance is neglected, but is always more expensive.

Railroads that own equipment to mix bituminous material can premix materials which can be stockpiled at convenient locations for maintaining crossing surfaces. The equipment for a stationary plant would consist of an asphalt storage tank, an asphalt heater, a bituminous mixer and aggregate bins equipped with batch hoppers and bin-loading equipment.

If this method does not meet specific needs, the bituminous mixers can be mounted on pneumatic-tired wheels and moved throughout the division to mix the materials at various job sites. In addition to the portable bituminous mixer, the auxiliary equipment required in this case would consist of an asphalt distributor for heating and transporting the asphaltic material. The aggregates could be measured by volume, thereby eliminating the necessity of portable batching bins.

By owning and operating their own equipment, railroads could obtain the following advantages: (1) Bituminous materials would be available at any point on their system when needed; (2) they can furnish small tonnages economically (because the quantities of mixed materials required in the average city or town is usually small, bituminous surfaces are frequently neglected because a commercial mixture is not always readily available); (3) savings could be realized through the use of low-cost bituminous materials; and (4) the means would be available to build new surfaces and maintain old surfaces at the proper time, essential to prevent excessive maintenance operation.

Travelers on highways have often observed that bituminous-surfaced crossings are frequently maintained by tamping dirt and gravel into the "pot holes" every day for a period of time. Finally, a bituminous mixture is placed in these holes and the daily maintenance eliminated. This procedure was necessary to maintain a smooth crossing. However, since no premixed bituminous materials were available, the section foreman used the next best available material—dirt and gravel. Naturally, these patches would not hold. This daily maintenance operation on every crossing consumed many unnecessary man-hours because of the lack of bituminous material for maintenance.

Had these railroads owned their own bituminous mixers, the conditions referred to would not have happened and many dollars would have been saved. Premixed "black top" of the cold-mix type could always be stockpiled and remain available when needed. It could be furnished from one of several central-mix stations established close to the source of material.

One method of operating railroad-owned bituminous equipment would be to have the stores department furnish premixed bituminous materials on requisition from each section foreman. This procedure would follow the established policy by which he secures many of his other supplies at the present time. Another method for using such equipment would be for the maintenance-of-way department to operate it. The various supervisors within a division could then procure the materials and mix their requirements either from several centrally located points, or could move the equipment through each district, stockpiling a supply of mixed materials at each section headquarters needing them.

Railroad-owned bituminous equipment will definitely eliminate delays in the procurement of premixed materials. This is important in the proper maintenance of bituminous surfaces. The old adage, "a stitch in time saves nine", could well be changed to read, "a patch in time saves nine". Remember, a "pot hole", if not repaired, never grows smaller. The only successful maintenance of such a surface is to use like materials to assure adequate bond between the old and new surfaces.

Good public relations with citizens in every town through which a railroad operates is essential. Certainly rough crossings, walks, platforms and parking areas will not promote good will.

As everyone knows, probably the most critical maintenance season for bituminous surfaces is experienced in late winter and the early spring months. This is the period of most severe freezing and thawing, as well as the usual spring rains. This is also the period when the supporting foundations are the least stable. Preventive maintenance during this period is necessary to save costly corrective repairs.

In summarizing, it must be emphasized that in maintaining bituminous surfaces, time is all-important. Railroad-owned bituminous equipment provides the means by which timely maintenance can be executed at a lower cost than is otherwise possible. Lower costs are possible not only because the railroad can produce the bituminous mix cheaper themselves, but because they eliminate much of the cost of major repairs by not having to neglect "preventive" maintenance for the lack of materials. In other words, the railroads will use their own equipment to mix small amounts, but would, on the other hand, wait to accumulate orders for a carload of commercial premix. Postponing the patching in that way requires extensive corrective maintenance later.

Might Use in Large Cities

By T. M. PITTMAN
Division Engineer, Illinois Central, Memphis, Tenn.

Generally speaking, a railroad is justified in owning a portable bituminous mixer only when there are many crossings or driveways to be paved within a relatively small area. This would apply almost entirely to large cities and terminals. Even under these conditions, a close analysis would be required

to justify buying this equipment. The extent of which "hot mix" is used would be the controlling factor. The availability, low cost and ease of handling cold mix has made the use of this type of material almost universal and there are only a few places where hot mix is still used.

Even if hot mix is required in sufficient quantity to justify purchasing a mixing unit, it might prove more economical to locate the unit in a fixed position at some central, convenient point, rather than haul it around from place to place. In addition to hauling the outfit, it will be necessary to transport materials, fuel and supplies to every new location, inevitably resulting in a lack of some material or a surplus and consequent waste of another.

If the plant is located at a central point, facilities for storing and handling materials and operating the plant can be simplified and it would cost less to transport the completed mixture to the area to be paved than to haul all of the separate ingredients, even if the first procedure required facilities for keeping the hot mix en route or reheating it at the site. If the plant should be used for cold mix, it is probable that the ready-mixed product could be purchased from established commercial plants cheaper than it could be mixed by company forces. Furthermore, the commercial mix would furnish a superior product because of closer supervision by experienced operators and more elaborate control of the mixing process than would be justified in a small plant.

Contractors Preferred

By George S. Crites
Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

Years ago, when paved highways were few and seldom adjoined railroads, it was expedient for railroad maintenance forces to mix and place bituminous surfaces for station platforms, runways and highway grade crossings. Mixing was done at the job site if the work required was extensive but when a small amount of material was needed at any one location, the mix was made at a central plant and shipped to the sites. Sometimes, a whole district might be supplied by one carload which was moved from place to place where needed.

By and large, the whole procedure was messy and workmen who were not fitted for handling this kind of work had their clothes and tools damaged. Materials were tamped or pounded into place rather than being compacted by suitable equipment. Few, if any, crossings placed in this way sealed out water.

Now, contractors who handle bituminous paving jobs are available in almost all localities to handle economically almost any job of paving or patching with mixes and equipment that fit the particular job. Trackmen can be kept on the track and not put at work in which they have too little experience.

Where the magnitude of bituminous work does not justify a contractor, mixes from commercial plants can be shipped in proper cars as was done before from railroad's central mixing plants and trackmen who are familiar with such work can patch or renew highway grade crossings quite satisfactorily. It is best to have a roller for such work and it might be arranged to move a roller in the car containing the mix.

Where the commercial plant is not too far from the places where work is to be done, it is usually preferable to have the proper commercial mix delivered by truck where it is to be used rather than having it moved by rail.

Thwarting Floods by Anchoring Tracks

What conditions, if any, justify the anchoring of track to prevent its being carried off the roadbed by high water? What anchoring methods are most effective? Explain.

Anchors Are Very Effective

By A. B. Chaney
Assistant Chief Engineer System, Maintenance, Missouri Pacific, St. Louis, Mo.

Track that is frequently washed off the roadbed should be anchored if the completion of permanent corrective measures must be deferred for any considerable length of time. Then, should a flood occur before permanent protection has been provided, the anchoring of such track greatly facilitates the work of restoration and reduces the time required to open the line of traffic. In many instances the anchoring of track in this manner reduces by 50 per cent the cost and time required to restore service.

One effective and economical anchoring method is to use one-piece welded galvanized screw anchors. These are placed in the center of track between ties and spaced two rail lengths apart. The anchor is installed with the ring end of the shank about three inches below the top of tie. It is fastened to adjacent ties by means of a 5/16-in. galvanized stranded wire which is passed through the ring and around the ties. The wire ends are fastened together with a 3-bolt galvanized clamp and secured to the ties by 1½-in. copperweld staples. There is sufficient slack in the wire to permit about a three-inch adjustment in the line and surface of the track and to allow the renewal of ties without disturbing the anchor.

Anchors installed in this manner do not interfere with rail laying, track circuits, or the operation of ditches, tampers or other work equipment and roadway machines. Eight-inch screw anchors, 7 ft. in length, are used on primary lines, and 6-in. screw anchors, 5 ft. 6 in. in length, are satisfactory for light-traffic lines where depth of ballast is maintained. All materials used in the anchor assembly are signal-line stock items. Anchors can be installed by trackmen at a cost of about $5 per anchor, or $675 per mile in place.

Under severe conditions a few anchors may be washed out, but a sufficient number hold to retain the track on the roadbed with a maximum displacement of 2 to 4 ft. from the original center line.

Anchors Seem Impractical

By B. S. Converse
Division Engineer, Chicago & North Western, Sioux City, Iowa

It is difficult for me to conceive of any system of anchorage which would be effective in preventing track from being washed off of the subgrade when subjected to flood waters.

In general, track washouts occur when rising flood waters, which have become impounded by the track embankment, reach the track structure. These waters, working under an increasing head, flow through the tie cribs and over the rails, securing away the ballast. When the ballast section has been reduced to the point where it can no longer hold the ties in place, the track is washed out of alinement by the force of the flowing water. This situation may be aggravated by driftwood lodged against the rails and tie ends.

Considering that the track is held in place by the ballast section and can only be washed out of alinement after displacement of the ballast material, it might seem that "anchorage" could be achieved through stabilization of the ballast material. Yet the very function of ballast precludes any of the various forms of stabilization which come to mind such as cementing or encouragement of vegetation growth. Piling driven along the track might hold the track to line but would not prevent the washout of ballast. Further, I have seen track upended so that it was left standing on edge or turned upside down by flood waters so that there is no assurance that such a method would prevent track from being displaced.

It would not appear that anchorage, *per se*, is practicable. However, track washouts can be prevented by other means. A thorough analysis of the situation may reveal the need for additional waterways through the embankment or construction of earth dikes or ditching. However, the most effective solution usually lies in raising the grade a sufficient amount to place the track structure well above the high-water elevation.

Better to Riprap Slopes

By GEORGE S. CRITES
Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

Where flood waters may periodically sweep tracks off embankments, the most secure and lasting method of preventing recurring trouble is to riprap or blanket the slopes up to the crown with secure rock or cement protection and use track ballast which will not readily erode. This method will allow the track to be serviceable as soon as the flood waters run off.

In places where sudden, unusual storms may overrun tracks, there is no sure way to anchor the tracks to the roadbed that will prove economical. Such floods are never the same nor do they always strike the same locations. Often, one of these storms strikes unexpectedly in some location and may not hit there again for years. Any track anchorage for such disasters probably would be in the wrong place even should it remain intact.

If tracks and roadbeds do not economically justify permanent protection against being washed out of service, the cheapest procedure is to follow the receding flood waters and restore the tracks to service as cheaply as possible. If the damage is great, community flood control may be the answer. There are few locations where tracks would be carried off the roadbed without causing great damage to adjacent properties.

Silicones for Waterproofing Masonry

What are silicones? To what extent are they adaptable to waterproofing railway masonry? For what other uses are they suitable? Explain.

Have Many Advantages

By PETER R. CICCOLILLI
Supervisor of Bridges and Buildings, Central Railroad of New Jersey, Jersey City, N. J.

Silicones would be classified by a chemist as organo-silicon-oxide polymers, whereas a layman might classify them as chemical cousins of glass. An engineer would classify silicones as a new class of engineering material among whose characteristics is that of being water repellent. They have revolutionized waterproofing to the extent that, besides an economical way of stopping leaks in any type of exterior, above-grade masonry, they have been found to be very durable. Where aluminum stearate and wax-base waterproofing compounds are effective from three to a maximum of five years for a two-coat application, one application of silicones is effective for a period of 8 to 10 years.

Wax and stearate colorless waterproofers have the following limitations:

(1) They produce a change in the appearance of the masonry.

(2) Since the bulk of the surface waterproofing is solvent, the larger pores do not close entirely after the solvent evaporates even though they are reduced in size and possess water repellency.

(3) On masonry surfaces having a fine texture, that is, with pores small enough for a continuous filler to be produced by the waterproofing, it interferes with the "breathing" of the wall. This causes an accumulation of blisters behind the coating due to differential vapor pressure which tends to detach the film bodily.

(4) The life of the surface waterproofing is not long—shortened by volume changes which are effective in detaching the surface coating, and by oxidation which causes embrittlement and a more ready detachment of the film.

(5) Where soluble salts are present in masonry, penetrating moisture dissolves them. This moisture can come to the surface, evaporate and deposit salts directly behind the surface coating. Changes in temperatures and moisture conditions show salt-crystal growth which exerts tremendous forces. Thus the surface coating may be pushed off bodily. These salts may be liberated in brick, concrete masonry units, portland cement or even in the sand used for mortar. They may even be formed from sulphuric acid sometimes found in winter rains.

On the other hand, silicone surface waterproofing overcomes some of the deficiencies of the wax and stearate waterproofers by virtue of the following characteristics:

(1) It is colorless, water repellent, and penetrates deeply into masonry without affecting its appearance.

(2) It coats pores, fissures and cracks with an insoluble, non-oxidizing, invisible film which effectively stops the capillary action by which water is absorbed.

(3) The pores and other voids are not clogged by the treatment, so that the rate of transpiration or "breathing" is essentially that of an untreated wall. The repelling action of silicone keeps out water, even heavy wind-driven rains.

(4) Hydrolysis of the silicone binary compound may result in direct attachment to the masonry surface by valence forces. The excellent resistance of silicones to oxidation under varying conditions of humidity is well known, making this a factor of importance.

(5) Results of forced efflorescence are overcome by silicones, with excellent results obtained on shale brick surfaces.

Silicone water repellents also prevent damage from freezing and thawing. They help to keep masonry surfaces clean because water and suspended dirt roll off instead of being absorbed. Silicones are easily and quickly applied to sur-

faces without discoloration in temperatures below freezing, whereas wax and stearate-base water-proofers have their limitations as to the temperatures at which they can be applied.

Silicones are suitable for numerous other uses, such as protective coatings. Silicone-based aluminum paints are ideal for powerhouse stacks having temperatures of about 1000 reg. F. Waxes and polishes having silicones as constituents are excellent. Silicone lubricants fall within the same classification.

Repellent Soon After Use

By Patricia A. Collins

Linde Air Products Company, division of Union Carbide & Carbon Corp., New York

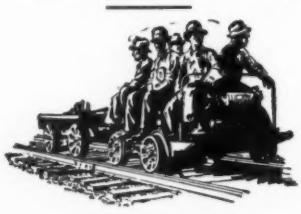
Our silicone masonry water repellent is a resinous material whose basic chemical structure is a long chain of alternating silicone and oxygen atoms, to which are attached various organic constituents. It was specifically developed as the basic ingredient of a clear water repellent for exterior, above-grade masonry. It is effective on brick, mortar, and other types of masonry structures such as those of sandstone, and concrete. It is intended for surface application to the exterior masonry, and not for integration with the masonry.

Brick and mortar walls are often laid with voids in many or all of the interior mortar joints. Hairline cracks also often exist between mortar and brick in the exterior bed joints. These factors permit water passage through such construction as a result of capillary action or wind pressure. When properly applied, waterproofing materials containing silicone penetrate the pores of the masonry and effectively repell capillary water seepage. They do this without sealing the pores, so that moisture which has been trapped inside can be released. A single flooding coat is all that is necessary. This treatment effectively reduces penetration of water and consequently minimizes plaster cracking, paint blistering, and damp staining of interior finishes. Spalling of brick and mortar and loss of decorative stone work, as well as efflorescence and staining, are reduced.

There are many advantages of using silicone as the base of a clear masonry water repellent. For instance, it is: (1) Quick to develop water repellency after application; (2) versatile, performing well on most types of masonry; (3) easy to apply either by spraying or brushing; (4) readily applied at temperatures as low as freezing; (5) highly effective against efflorescence; (6) clear and invisible, causing no change in the appearance of the masonry; (7) penetrating, insuring maximum durability; (8) nonsealing of the masonry pores, thus allowing the masonry to "breathe"; (9) soluble in inexpensive solvents, thus allowing economical preparation of the finished water repellent; and finally, (10) paintable, permiting oil-base paints to adhere without impairing the water repellency of the underlying mortar.

Another very important property of a masonry water repellent is the useful life which can be expected from a treatment of a masonry surface. Since all of the silicone polymers currently considered best suited for this use have been available for only about two years, the results of reliable, really long-term exposure tests are not yet available. It can certainly be said that the use of a silicone of this type satisfactorily prevents seepage of water into above-grade masonry walls for a period of at least two years providing the following conditions are met: (1) The wall was free of major voids and cracks prior to the treatment and no such flaws have since developed due to the settling of the structure or other causes; and (2) that the wall is constructed of one of the relatively neutral materials previously described. It should be pointed out that the surface repellency which is readily apparent immediately after the silicone treatment will not persist for any considerable period except in those areas where little or no air-borne dirt accumulates on the treated wall. This loss in surface repellency is not particularly important if the silicone treatment is conducted properly since the real protection against water seepage is obtained by the treatment of a reasonably thick layer on the wall surface.

The application of a clear water repellent to exterior, above-grade masonry, although extremely simple, must be done with care and in a workman-like fashion. It will perform satisfactorily if applied correctly. Certain preliminary steps are recommended. The masonry should be caulked and tuck pointed, if necessary, to reduce leakage due to major defects. Extremely dirty surfaces should be cleaned before application.



The solution should be applied only on dry days when the masonry appears relatively dry. A high water content will prevent adequate penetration. It can be successfully applied at temperatures as low as freezing. It is applied as a heavy flooding coat by either brushing or spraying. If a brush is used, it should be flooded on rather than brushed out to assure adequate penetration. If a spray is used, a liquid spray gun such as the usual garden spray is recommended. High-pressure spray guns cause excessive evaporation and reduced penetration of the repellent. Using these recommendations, coverage of 150-200 sq. ft. per gal. is obtained on hard-fired brick and mortar construction. If a second coat is used, adequate time should be allowed for the solvent to evaporate from the first coat before application of the second.

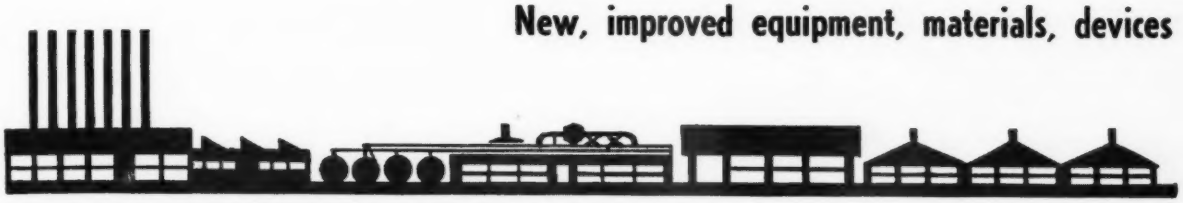
Naphtha or Stoddard solvent can be used to remove the waterproofing solution accidentally sprayed on windows. The solvent in silicone water repellents will usually tend to soften oil-based painted surfaces but, if allowed to dry without rubbing, it should not affect them.

If silicone water repellents are used on masonry which has had a previous application of a pore-sealing water repellent, penetration may be somewhat reduced, thus lessening its durability and effectiveness. Results depend on the general condition of the weathered surface.

For masonry surfaces with large pores, especially the cinder block and cellular concrete types, the effectiveness of this type of water repellent treatment against hydrostatic head is obviously greatly reduced. For best results on this type of building material, the pores should first be filled with a cement paint or thin grout, well brushed in with a stiff brush. This treatment is then followed with an application of silicone solution. If the treatment is performed according to the recommended procedure, maximum water repellency will develop within two to three hours. Normal precautions should be taken regarding the fire hazards of inflammable solvents and inhalation or spillage of this material on persons handling it.

PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices



(For additional information on any of the products described in these columns, use postcards, page 739)

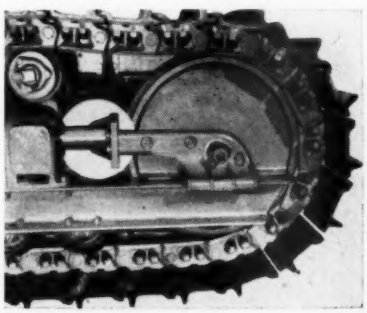
LIGHTWEIGHT TIE-END TRIMMER

WOOLERY Machine Company, Minneapolis, Minn., has added a unit known as a Tie-End Trimmer to its line of lightweight on-track machines. This machine is designed to saw off the ends of long ties to a uniform line so that ballast-cleaning equipment, scarifiers, diskers, etc., can work up close to the ends of the ties, thereby avoiding the formation of mud dams at the ends of the shortest ties. The new unit utilizes the same NU Tie Cutter machine with lifting handles as used on the company's standard Tie Cutter but without the standard undercarriage. The undercarriage is replaced by a four-wheel underslung trailer provided with removable extension bars that serve as a mounting for the tie cutter which, in its working position, is clamped to the bars with the saw from 4 to 4½ ft. from the center of the track.

When clearing for trains, the tie cutter is quickly unclamped from the bars and set off, after which the trailer is removed from the rails. For towing the unit behind a motor car while deadheading, the tie cutter is removed from its working position and set on the deck of the trailer where it, as well as the extension bars, are clamped in place. These clamps can be unbolted to present a clear deck if it is desired to use the trailer for other hauling when not in tie-end trimming use.

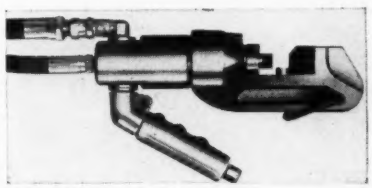
HYDRAULIC ADJUSTER FOR CRAWLER TRACKS

THE HYDRADJUSTER, a hydraulic track adjuster available for all models of Allis-Chalmers, Caterpillar and International crawler tractors, has recently been made available by the Machinery Parts Sales Corporation, Dallas, Tex. With this device it is claimed that a few "shots" from a standard grease gun will take up the slack in the track, thereby eliminating the laborious time-consuming task of manually adjusting the track with adjusting screw and nut. The manufacturer states that, due to the ease of adjusting the tracks, the operator will keep the tracks of his crawler tractor adjusted properly, thus eliminating unnecessary wear on rails, idlers, rollers, sprockets and other mechanical parts. Installation of the Hydradjuster can be made in the field. Once the tracks have been broken, it can be installed in approximately 1½ hr., approximately the time required to adjust the tracks on large-model tractors by the old method.



ROD CUTTER DESIGNED FOR RAPID PRODUCTION

A NEW Model 200-E Guillotine hydraulic cutter has recently been developed by the Manco Manufacturing Company, Bradley, Ill. The device, designed for the rapid production cutting of high-carbon steel



rod up to ½-in. diameter, features a ¼-sec. complete cutting cycle. A press of a button mounted on the handle grip of the cutter causes the unit to exert a thrust of up to 20 tons, derived from a portable, high-speed hydraulic pump, driven by a 2 hp., 220/440 volt, 3-phase motor, through a 25-ft. hydraulic hose. Blades are claimed to be easily removable for sharpening. The Model 200-E is also said to be adaptable to high-speed riveting, punching and swedging operations, and is available with hot cutting extensions.

For additional information on any of the products described on these pages, use postcards, page 739.

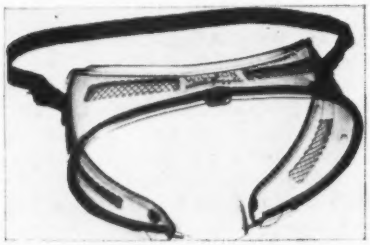
JACK INCREASES DRILL PRESSURE

PRODUCTION of a new portable construction tool called the Dril-Jack, has been announced by the Time Saver Tool Company, Inc., Cleveland, Ohio. The manufacturer claims that, with this tool, a worker can exert force up to 2,000 lb. where more than 100 lb. pressure is required for drilling holes in concrete

or steel. The device consists of a clamp which holds a regular drill motor. The jacking action of the tool forces the drill motor ahead. An instant pressure release on the lift handle provides one-hand control. The tool can be operated in confined space or can be extended to as much as 25 ft., with quickly coupled extension sections. The tool weighs 9½ lb.

GOGGLES FEATURE GREATER COMFORT

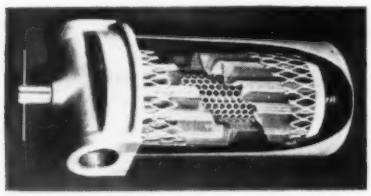
AN IMPROVED, all-plastic safety goggle is now being offered by Willson Products, Inc., Reading, Pa. Known as the Willson No. 91 Mono-



goggle, this new item features a flexible, fully transparent frame molded of Vinylite. The manufacturer claims that, although the new frame comfortably conforms to all facial contours, a newly-designed lens-retaining feature adds sufficient rigidity to the frame so that there is no sacrifice of protective efficiency. The lens is of 0.060-in. acetate, and is separately replaceable. The goggle weighs approximately one ounce, and is said to fit easily over all types of prescription glasses.

SYNCLINAL FILTERS FOR WATER FILTRATION

THE Marvel Engineering Co., Chicago, has announced that its complete line of synclinal filters, formerly available for use with hydraulic and other low pressure oil systems only, are now available for water filtration use. The sump type filters are available in capacities of from 5 to 100 g.p.m., while the line type filters vary in capacity from 5 to 50 g.p.m. Monel filter mesh sizes range from coarse 30 to fine 200. The line type filters may be operated in any position and may



be serviced without disturbing pipe connections. The balanced synclinal design is said to provide a maximum filtering area with a large capacity for accumulating filtered-out matter, thus allowing longer periods of operation between cleanings.

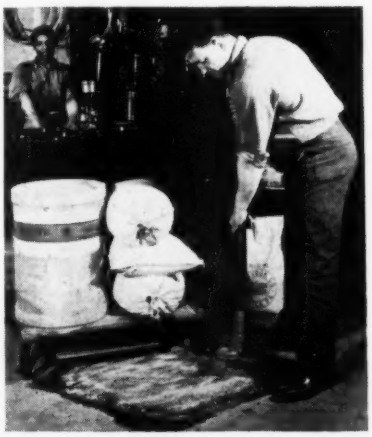
COMBINATION CRANE AND TRAILER

SILENT Hoist & Crane Co., Brooklyn, N. Y., manufacturers of the self-propelled, rubber-tired Krane Kar mobile swing-boom crane, have now broadened the usefulness of this material-handling unit with the development of the Krane Kar Trailer Transport. The mobile crane has been integrally linked with a trailer, thus providing a unit incorporating a crane for lifting, stacking, spotting and load-

ing applications, and a transporter for carrying and delivering bulky, heavy or large quantities of varied material in yards and shops. Of special interest is the fact that the mobile crane provides dual seats and dual operator controls in order that the unit may be operated in narrow or conjested areas without turning the machine around. The operator can perform his work from one seat, and then shift over to the opposite seat and travel to his destination.

FLOOR PATCH IS QUICK-SETTING

THE Flexrock Company, Philadelphia, Pa., has announced the availability of "Instant-Use," a fast-setting floor-patching material for use in repairing concrete, brick, stone or asphalt floors. The manufacturer claims that the ready-mixed material may be applied quickly—the only preparation necessary being the application of a primer. A light tamping sets the material in place and, it is claimed, the immediate movement of traffic over the repaired area not only does not harm the patch, but aids in the smooth setting of the material.



"The BRUSH On My Territory Is Completely OUT of CONTROL"

(DIVISION ENGINEER)

ENGINEER M. of WAY: "I noticed it on the inspection trip ten days ago. Must be three or four years since you went in there with labor and cleaned it up. Have you made an estimate on the cost of labor to do the job?"

DIVISION ENGINEER: *"Yep, I have the figure—it's so high it's unbelievable! Seems to me we are confronted with this brush problem much the same as we were on the weed problem some years back, before we started to use the READE SERVICE on weed spraying. We just cannot afford to do this type of work using the labor available to us."*

ENGINEER M. of WAY: "You may be right, Jim. I was talking to Jack Halligan ten days ago. You recall they did brush work using chemical last fall. He tells me this experiment on their part is working out nicely. The job looked good late in the fall and this year's growth is about 30%, so benefits carried over into a second year."

DIVISION ENGINEER: *"That's the answer, boss. Reade has one of their new modern trains over on the M. G. & L. right now spraying Brush Killer. At the end of a day using their method, there really is something to show for the dollar spent. We can save big money, do a real job. And, the dollars saved will look good, for my territory needs rail and ballast beyond that provided for in the budget."*

(This is just another typical problem that is facing all railroads.)

READE EST. 1883

READE MANUFACTURING COMPANY, INC.
Chemical Weed Killers
Jersey City 2, N. J.
Western Office: Chicago 28, Ill.

THE MONTH'S NEWS

Happenings among the railways — the associations — the suppliers

Changes in Railway Personnel

General

H. Petrie has been appointed superintendent of the Tennessee, Alabama & Georgia at Chattanooga, Tenn., with jurisdiction over maintenance of way, maintenance of equipment and transportation departments. He succeeds **A. C. Craighead,** who has retired.

H. J. McCall, assistant superintendent of the Idaho division of the Northern Pacific at Pasco, Wash., and an engineer by training and experience, has retired after 46 years of service. Mr. McCall began his career in the engineering department of the NP and served as roadmaster and trainmaster on various divisions before being appointed assistant superintendent of the Lake Superior division at Duluth, Minn., in 1934. He was named assistant superintendent at Pasco in 1941.

H. H. Hill, who has been named superintendent of transportation of the Northern division of the Atlantic Coast Line at Savannah, Ga., (RE&M, June, p. 598), was born in Colleton county, S. C. He entered the service of the ACL on April 3, 1926, as an apprentice foreman on an extra gang at Ridgeland, S. C.

H. H. Hill

On May 1, 1940, he was appointed roadmaster at Charleston, S. C., and in 1944 was advanced to general roadmaster at Rocky Mount, N. C. On January 1, 1949, Mr. Hill was appointed superintendent of the Richmond district at Rocky Mount, the position he held prior to his recent promotion.

M. L. Horton, whose appointment as superintendent of the Richmond district of the Atlantic Coast Line, with headquarters at Rocky Mount, N. C., was recently announced (RE&M, June, p. 598), is a native of Douglas, Ga. Entering the service of the Coast Line on a construction gang in December 1924, he has held various positions with the roadway department and was appointed roadmaster at Rocky Mount, N. C., on May 1, 1942. Two months later he entered the U. S. Army and served with the 703rd Railway Grand Division until October 16, 1945. Upon his discharge from the army, Mr. Horton was assigned to the position of assistant to general roadmaster at Florence, S. C., and on July 6, 1946, he was appointed general roadmaster at Florence. He was serving in the latter capacity at the time of his recent promotion.

Engineering

Arthur Mayfield has been appointed office engineer on the Pittsburgh & Lake Erie at Pittsburgh, Pa.

A. B. Hillman, Jr., supervisor of track on the Illinois Central at Council Bluffs, Iowa, has resigned to accept a position as assistant engineer on the Chicago & Western Indiana at Chicago.

G. H. Perry, supervisor of structures on the New York division of the Pennsylvania, has been appointed assistant engineer in the office of chief engineer of the Eastern region.

J. S. Miller, resident engineer for the Jekyll Island State Park Authority at Jekyll Island, Ga., has been appointed assistant engineer on the Central of Georgia with headquarters at Savannah, Ga.

V. C. Hanna, superintendent of bridges and buildings for the Terminal Railroad Association of St. Louis at St. Louis, Mo., has been promoted to chief engineer, succeeding **Colonel H. Austill,** who has retired after 42 years of railroad service.

Jack O. Holladay, draftsman in the office of the chief engineer of the Louisville & Nashville at Louisville, Ky., has been promoted to assistant engineer on the Louisville division, succeeding **Conrad W. Hale,** who has been appointed assistant engineer in the bridge department, chief engineer's office, Louisville. **G. W. Potts,** draftsman in the office of the chief engineer at Louisville, has been promoted to resident engineer at Madisonville, Ky., succeeding **L. D. Thomas,** who has been transferred to Radnor, Tenn.

H. C. Archibald, assistant to the chief engineer of the Boston & Maine, has been promoted to assistant chief engineer, with headquarters as before at Boston, to succeed **C. S. Robinson** who has retired. **F. R. Spofford,** assistant division engineer at Dover, N. H., has been promoted to assistant chief engineer at Boston to succeed Mr. Archibald.

Because of the imminent completion of the Elgin, Joliet & Eastern's new retarder yard at Gary, Ind., the headquarters of **S. H. Shepley,** assistant chief engineer, have been transferred from Gary to Joliet, Ill. Concurrently, Mr. Shepley has resumed his former duties as assistant chief engineer. In addition, relative to the completion of the project, the position of engineer maintenance of way has been abolished and **A. C. Hoyt** has been appointed to his former position of engineer bridges and buildings and **A. C. Johnson** has reassumed his position as engineer of design.

Newell R. Forbes, recently appointed assistant to the division engineer on the Illinois Central at Memphis, Tenn. (RE&M, June, p. 604), was born November 27, 1918, at Walnut, Iowa, and graduated from the University of Iowa in 1940. He entered the service of the IC on April 5, 1940, as a chairman in the engineering department at Vicksburg, Miss., and on April 15 of the following year was promoted to rodman at Vicksburg. From August 4, 1941, to October 15, 1945, he served in the armed forces, and on November 17 of the latter year was promoted to instrumentman at McComb, Miss. Mr. Forbes was named assistant supervisor of track on the Louisiana division on August 16, 1947, and on November 16, 1948, was promoted to supervisor of track at Mendenhall, Miss. On April 1, 1950, he was transferred to the Mississippi division at Corinth, Miss., where he was located at the time of his recent promotion

Robert J. Klueh, whose promotion to assistant engineer of bridges, Buffalo and East, on the New York Central with headquarters at New York, was anannounced recently (RE&M, June, p. 602), was born at New York on April 25, 1909. Prior to graduating from New York University with the degree of Bachelor of Science in civil engineering in June 1932, he worked summers in the office of the district engineer of the

(*Continued on page* 784)

ALADDIN LUBRICATOR

$178.00 delivered

Only one moving part:

The "Aladdin" has no pumps or valves. A spring-loaded piston, the *only* moving part, descends in a cylinder under vibration from traffic—and delivers the required amount of standard grease *automatically* to the running side of the rail.

One-man installation:

No track alteration, rail drilling or gauge widening is required to install the "Aladdin". And since it weighs only 50 pounds—it can be handled and installed by one man *in less than half an hour.*

Proved performance:

Today, thousands of "Aladdin" Lubricators are in use on main lines... in yards... under one or two-way traffic... in all climates. The "Aladdin's" low cost means you can now economically specify a lubricator for every rail wear location. Why not check your lubricator requirements today? Write for Bulletin A.

H. T. KENNEDY COMPANY, Inc., 37 Wall St., New York 5, N.Y.

New York Central at New York. Entering full-time service in 1932, he held successively the positions of chainman, rodman, instrumentman, junior engineer, and designer and detailer in that office. In October 1941 he was transferred to the division engineer's office, and a year later was promoted to assistant supervisor of track, in which capacity he served successively at Syracuse, N. Y., and New York. In October 1949 Mr. Klueh was advanced to supervisor of track at Wellsboro Junction, Pa., the position he held at the time of his recent appointment.

J. T. Evans, whose promotion to assistant division engineer on the Pennsylvania with headquarters at New York was recently announced (RE&M, June, p. 602), was born at Scranton, Pa., on May 31, 1917, and was graduated from Lehigh University with the degree of Bachelor of Science in Civil Engineering in June 1939. Entering the employ of the Pennsylvania as an engineering apprentice at Buffalo, N. Y., on August 8, 1940, gree of Bachelor of Science in engineering corps at Wellsville, Ohio, on January 1, 1941, and later served in that capacity at Johnstown, Pa., and Pittsburgh. On February 1, 1942, he was advanced to assistant supervisor of track at York, Pa., and was subsequently transferred to New Brunswick, N. J. On October 1, 1944, Mr. Evans was appointed supervisor of track, which position he held successively at Salisbury, Md., Cincinnati, Ohio, and Trenton, N. J. It was as supervisor of track at Trenton that he received his recent promotion.

J. T. Ward, office engineer for maintenance of way on the Seaboard Air Line, has been promoted to principal assistant

J. T. Ward

engineer, with headquarters as before at Norfolk, Va. **J. E. Spangler,** assistant division engineer on the Georgia division at Atlanta, Ga., has been promoted to office engineer to succeed Mr. Ward, and **C. Y. Jordan,** assistant to division engineer at Atlanta, has been advanced to assistant division engineer to replace Mr. Spangler.

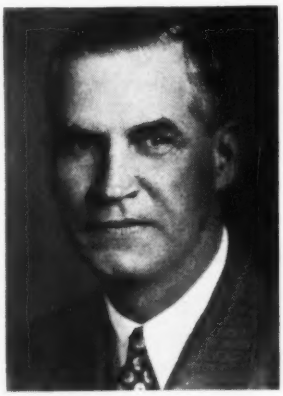
Mr. Ward is a native of Norfolk and a graduate of the University of Virginia with the degree of Bachelor of Science in Civil Engineering. He first became associated with the Seaboard in 1943 as assistant to the division engineer at Raleigh, N. C. The following year he became assistant division engineer at Raleigh, and in 1947 was appointed office engineer for maintenance of way at Norfolk, retaining the latter position until his recent promotion.

Mr. Spangler, a graduate of the Georgia School of Technology with the degree of Bachelor of Science in Civil Engineering, entered the service of the Seaboard in 1949 as a student engineer at Atlanta. He was soon promoted to assistant to division engineer of the Georgia division, and later to assistant divsion engineer there.

Mr. Jordan, who received his B.S. degree in Civil Engineering from North Carolina State College, first became affilated with the Seaboard in 1951.

Arthur B. Hillman, assistant chief engineer of the Chicago & Western Indiana and the Belt Railway of Chicago, has been promoted to chief engineer, succeeding **Victor R. Walling,** who has retired.

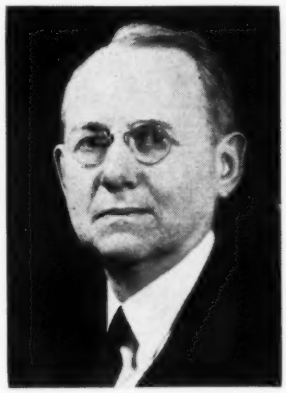
Mr. Hillman was born in Chicago on September 24, 1889, and received his higher education at the University of Illinois. He entered railroad service with the Lake Shore & Michigan Southern in



Arthur B. Hillman

September 1909, serving as a chairman and rodman until September 1910, when he joined the C&WI as a rodman. From 1914 until 1916 he served as a levelman and transitman, and in October of the latter year transferred to assistant engineer, maintenance, on the Belt Railway of Chicago. After serving as first lieutenant and captain with U. S. Army in World War I, Mr. Hillman returned to the Belt in April 1919 as an assistant engineer. He was appointed roadmaster in March 1925 and, in November 1927, was promoted to assistant trainmaster. From March 1929 until December 1930 he again served as assistant engineer, maintenance, following which he was promoted to roadmaster with jurisdiction over the bridge and building departments. During this period, from July 1937 to December 1938, he was assistant engineer in charge of the reconstruction of clearing yard. On January 1, 1940, Mr. Hillman was promoted to engineer maintenance of way of the Belt and the C&WI, and on October 1, 1948, was named assistant chief engineer of those two roads.

Mr. Walling was born May 24, 1880, at Tripoli, Iowa, and attended the University of Kansas from which he received the degree of Bachelor of Science in 1901 and an honorary degree in civil engineering in 1911. He entered railroad service as a draftsman for the Cananea Consolidated Copper Company's railway at Cananea, Sonora, Mex., and later served as an instrumentman on the Southern Pacific. From January 15, 1903, until March 1, 1907, he served as first assistant engineer for Cananea Consolidated. On the latter date he was appointed chief engineer for Cananea, which position he



Victor R. Walling

held until August 12, 1907, when he was promoted to superintendent and chief engineer. On June 20, 1912, Mr. Walling was appointed first assistant engineer on the Chicago & Western Indiana at Chicago, and later in the same year was promoted to principal assitant engineer in charge of track elevation, construction and maintenance. In 1933 he was named engineer maintenance of way of the C&WI and the Belt Railway of Chicago, which position he held until January 1, 1940, when he was appointed superintendent of the C&WI at Chicago. From March 1, 1944, until October 1, 1948, he served as assistant chief engineer of the C&WI and the Belt and on the latter date was promoted to chief engineer of those roads.

Track

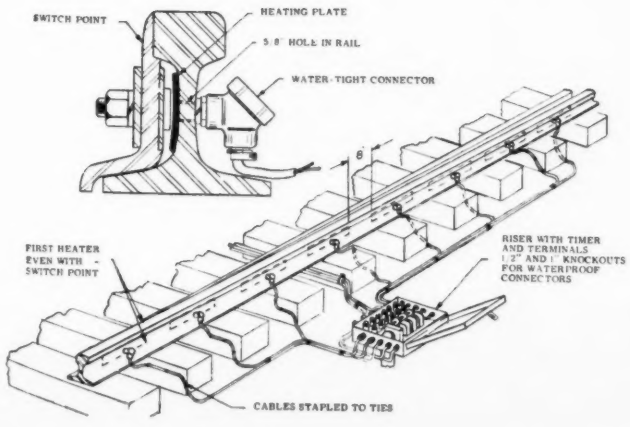
H. L. Read, assistant supervisor of track on the Illinois Central's Kentucky division, has been promoted to supervisor of track at Freeport, Ill., succeeding **H. L. Hood,** who has been transferred to Council Bluffs, Iowa. Mr. Hood succeeds **A. B. Hillman, Jr.,** whose resignation to accept the position of assistant engineer on the Chicago & Western Indiana at Chicago is noted elsewhere in these columns.

Because of the imminent completion of the Elgin, Joliet & Eastern's new retarder yard at Gary, Ind., **R. V. Dangremond,** special roadmaster, has been appointed to his former position of roadmaster of the Gary and Gary Mill divisions, and **E. V.**

(*Continued on page* 786)

ELEC-TIME Switch Heater

. . . LOW-COST – PUSH-BUTTON SNOW PROTECTION


SWITCH POINT
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WATER-TIGHT CONNECTOR
6'
FIRST HEATER EVEN WITH SWITCH POINT
RISER WITH TIMER AND TERMINALS 1/2" AND 1" KNOCKOUTS FOR WATERPROOF CONNECTORS
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ELEC-TIME Heaters are made from corrosion-resistant material and are available for all size switches and derails. Heater pads are individually replaceable and are wafer thin so that installation does not require grinding of rail. NOW is the time to figure on your needs for next winter. Write, wire or phone for complete information.

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SPEEDS UP TO 1800 R.P.M. FOR PUMPING CLEAN LIQUIDS

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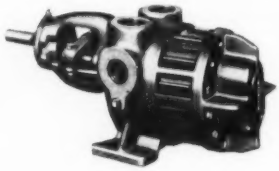
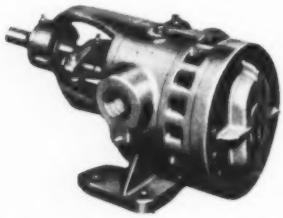
Four-port design offers 8 optional piping arrangements. Equal size helical gears run in axial hydraulic balance. Standard or bronze fitted; packed box or mechanical seal. Up to 300 P.S.I.—1 to 300 G.P.M. for clean liquids.





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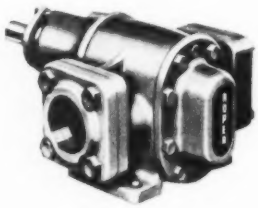

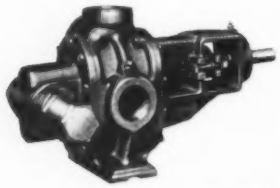

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Railway Personnel (Cont'd)

Paige, acting roadmaster, has been named to the new position of assistant roadmaster of the Gary Mill division.

Thomas F. Maloney, whose promotion to supervisor of track on the New York Central at Wellsboro Junction, Pa., was announced recently (RE&M, June, p. 608), was born at Brooklyn, N. Y., on May 18, 1915. He was graduated from Manhattan college in 1937 with the degree of Bachelor of Science in engineering, and in 1943 received his Master's degree in civil engineering from New York University. Entering the service of the New York Central on April 28, 1941, as a rodman on the Electric division at New York, Mr. Maloney was appointed transitman the following July. He was advanced to assistant supervisor of track on January 1, 1947, which position he held successively at Rochester, Brewster, and Hudson, N. Y. He was serving at Hudson when he received his recent appointment.

Bridge and Building

F. D. Day, supervisor of structures on the Conemaugh division of the Pennsylvania, has been transferred to the New York division to succeed **G. H. Perry,** who, as noted elsewhere in these columns, has been appointed assistant engineer in the office of chief engineer of the Eastern region.

David H. McKibben, whose appointment as supervisor of structures on the Pennsylvania at Harrington, Del., was was announced recently (RE&M, June, p. 610), was born at Homestead, Pa., on December 5, 1913, and received his higher education in structural engineering at Carnegie Institute of Technology. Entering the service of the Pennsylvania as a carpenter helper at Pittsburgh, Pa., on October 1, 1930, he subsequently served in various capacities in the building department until 1949, when he was appointed general foreman at Johnstown, Pa. In 1951 Mr. McKibben was advanced to assistant supervisor of structures at Buffalo, N. Y., the position he held at the time of his recent promotion.

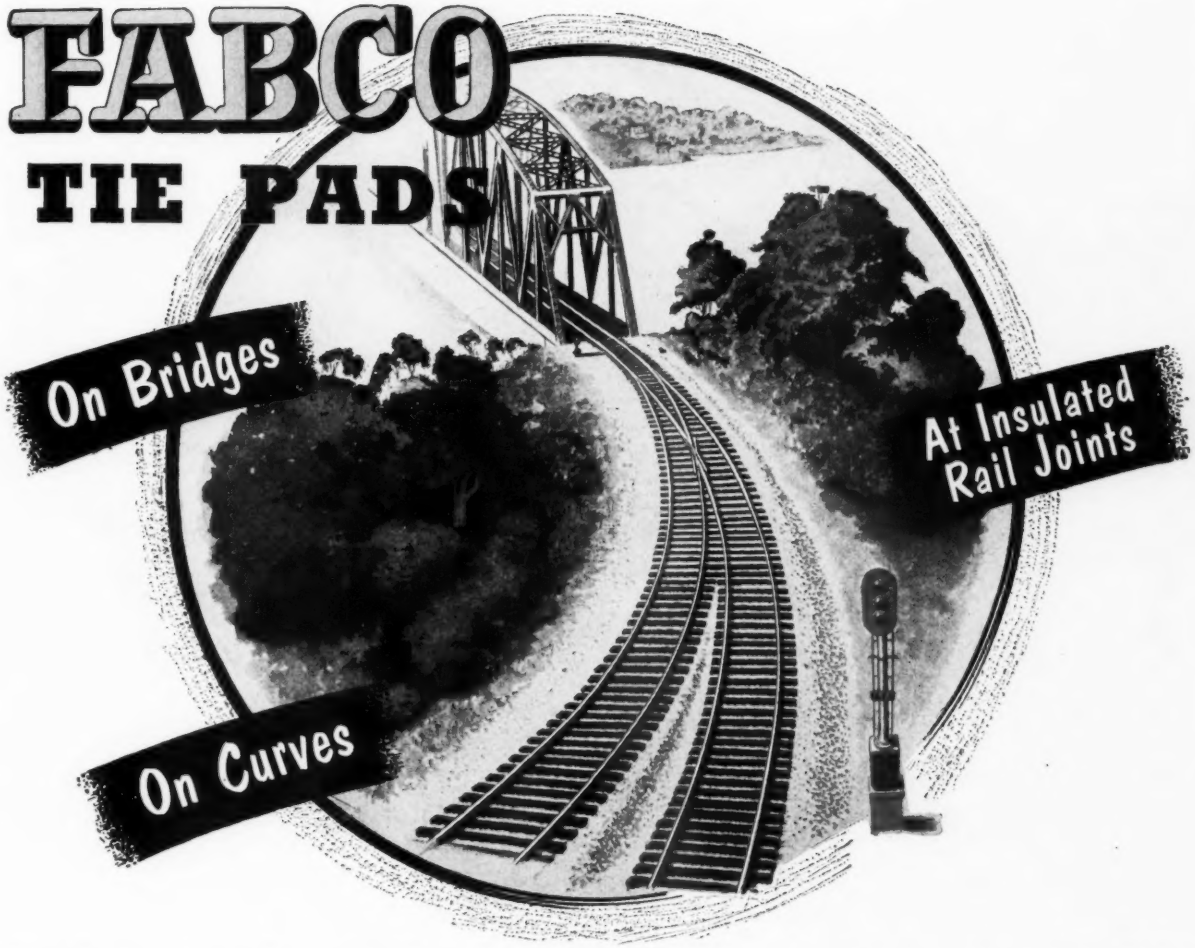
Association News

American Railway Engineering Association

Elaborate plans have been made by the A.R.E.A. for participation in the Centennial of Engineering which is being held at Chicago this summer to commemorate the 100th anniversary of the American Society of Civil Engineers. The Centennial celebration got underway in June and will extend through September. It includes a dynamic, integrated engineering exhibit at Chicago's Museum of Science and Industry (to be

(*Continued on page* 788)

FABCO TIE PADS



Reduce mechanical wear of ties . . . Increase tie life

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FABCO TIE PADS greatly extend tie life because they eliminate the mechanical cutting of the tie by the plate.

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maintained for at least five years); a dramatic stage production of engineering achievement and development, entitled "Adam to Atom," to be produced several times daily in a theater at the museum; and a convocation of more than 50 national and international engineering societies and associations to be held within the 11-day period Monday, September 3, through Saturday, September 13, with an international banquet on Wednesday night, September 10, to seat some 5,000, at the International Amphitheater.

Features of the convocation, which will bring together many of the world's outstanding engineers, will include not only several hundred technical meetings by the participating societies, but also a ten-day series of symposia on the various branches of industry, designed to reach and impress the public, which will include two days of sessions dealing with the engineering achievements of the various forms of transportation, including the railroads. The transportation symposium will be held on Monday and Tuesday, September 8 and 9, and will include at least one railroad session.

Participation of the A.R.E.A. in the Centennial will be tied to the transportation symposium and will extend over the three days, September 8, 9 and 10, with headquarters at the Palmer House. It is planned that working sessions of all the 23 standing and special committees of the A.R.E.A. will be held on September 8 and 9, scheduled around those specific sessions of the transportation symposium which A.R.E.A. members will wish to attend as a group. Wednesday, September 10, is being left open largely for participation in the general Centennial activity which will center at the Conrad Hilton hotel, and to afford A.R.E.A. members an opportunity to visit the exhibit and pageant and to participate in the international banquet that night.

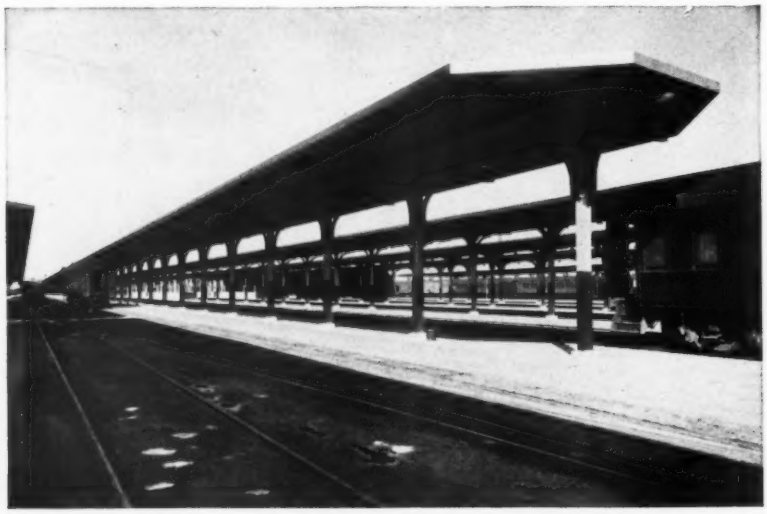
However, one of the most important aspects of A.R.E.A. participation in the Centennial will be a railroad engineering banquet which will be held in the Red Lacquer Room of the Palmer House on Monday, September 8, beginning at 6:30 P.M. This banquet will be open to all members, whether they are on committees or not, and, in addition, invitations have been extended to railroad engineers in the mechanical, electrical, signal and communications departments. Wives of members and guests of the A.R.E.A. will be welcome at the banquet. The theme of the banquet—"The Contribution of Railroad Engineers to the Welfare of the Country Over the Last 100 Years"—will be keynoted by the principal speaker of the evening—H. R. Clarke, chief engineer, Burlington Lines, and a past president of the A.R.E.A. There will also be another address "in a lighter vein" by Tennyson Gever.

Participation in the banquet will cost $7 per person. Advance reservations should be made through the office of the secretary of the A.R.E.A. All tickets will be distributed from a banquet ticket table on the mezzanine floor of the Palmer House on the morning of the banquet, and must be picked up by 12:00 o'clock noon.

Other AREA Developments

The Board of Direction, acting upon the recommendation of the Board Committee on Outline of Work, has assigned to three committees the following subjects: Committee on Highways—The effect of highway improvement projects on railroad properties, collaborating with the AAR Committee on Grade Crossing Elimination; Committee on Waterways and Harbors—Analysis of river and harbor projects, collaborating with the AAR Committee on Waterway Projects; and the Committee on Economics of Railway Location and Operation—Effect of derailments and dragging equipment on the cost of maintenance of way and structures, collaborating with Committees 3 and 5.

Members are reminded that all applications for committee membership in 1953 must be in the secretary's office by September 1, for consideration by the Board Committee on Personnel and the committee chairmen involved prior to the publication of the 1953 Outline of Work pamphlet early in December. Several committees are expected to have openings on their rosters for the coming year.



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Roadmasters' Association

With President A. H. Whisler presiding, the Executive committee of the association met at the Engineers' Club, Chicago, on July 14. In addition to members of the Executive committee, those present included chairmen of standing committees and of several of the committees that are preparing reports for presentation at the coming convention. The first item of business was to review those technical committee reports that had not been read at the previous Executive committee meeting. All except one of the committee reports have now been read and approved by the Executive committee, and are ready for presentation at the convention.

Other business transacted at the meeting included consideration of 32 membership applications. Also, the group discussed in detail the plans that are being made for the annual convention which will be held at the Conrad Hilton hotel, Chicago, September 15-17. Special attention was given to the plans that are being made for entertaining the wives of members. The business sessions of the meeting will consist largely of the presentation and consideration of the six technical committee reports, plus a num-

(*Continued on page* 792)

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 17-19, 1953, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—Next meeting October 27. E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

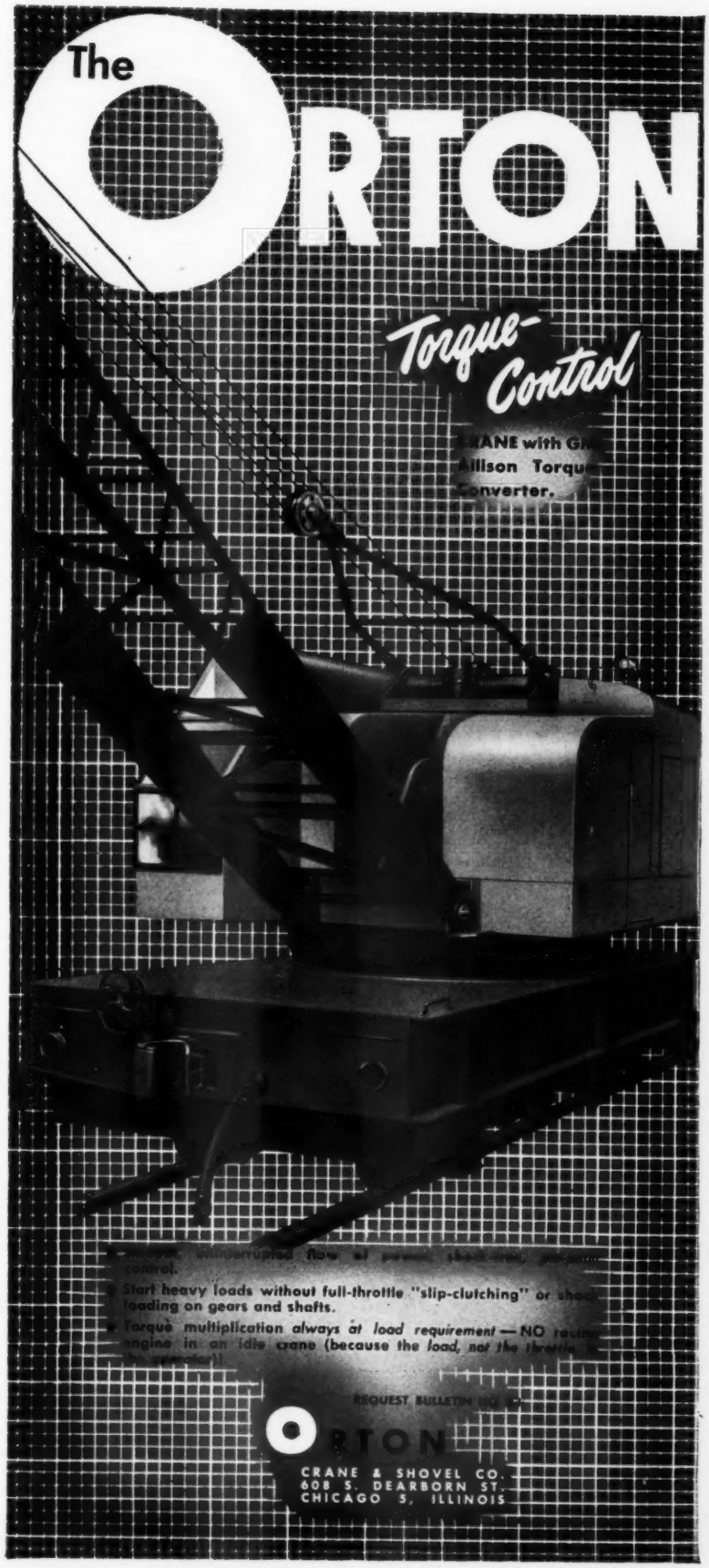
Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

National Railway Appliances Association—J. B. Templeton, Secretary, 1020 So. Central avenue, Chicago 44; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Annual meeting, October 22-24, 1952, Jung Hotel, New Orleans, La. Roy M. Edmonds, Secretary-treasurer, 1221 Locust Street, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.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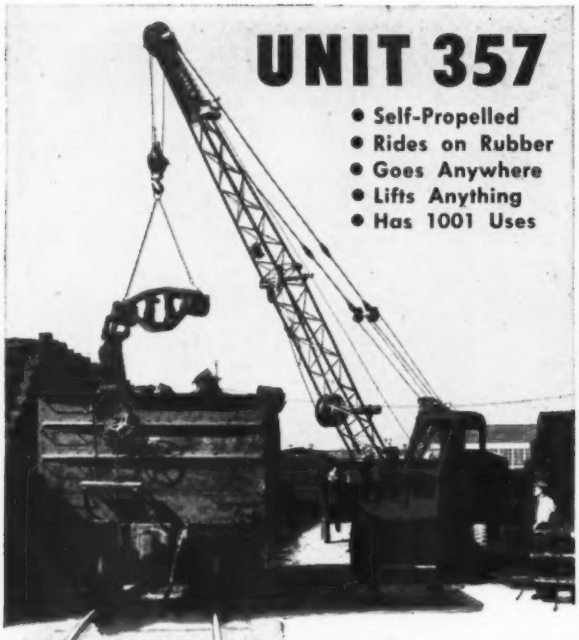

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On the Tracks
Off the Tracks

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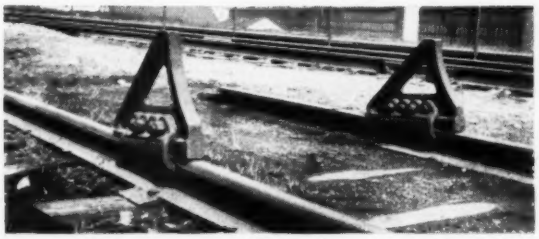

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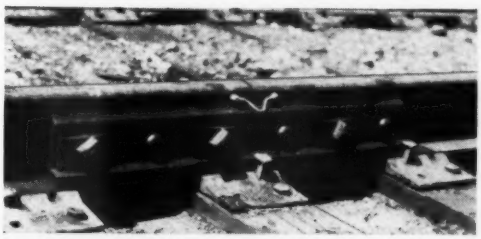

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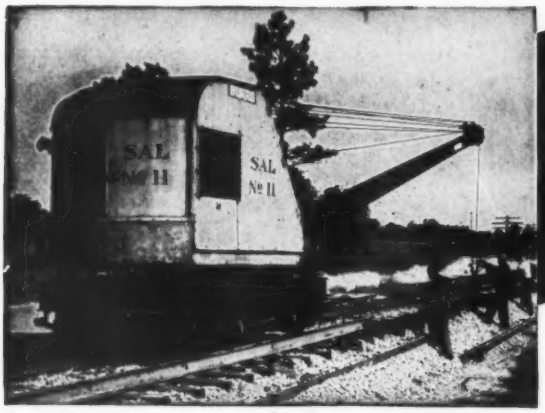

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Association News (Cont'd)

ber of addresses and one moving picture showing the laying of rail. In accordance with the usual practice, the meeting will be held concurrently with the annual convention of the American Railway Bridge and Building Association, and a number of joint sessions of the two groups will be held.

Bridge and Building Association

A meeting of the Executive committee was held at the Engineers' Club, Chicago, on July 21, under the direction of President Guy E. Martin. The principal purpose of the meeting was to review preliminary drafts of the eight technical committee reports that are to be presented at the convention at the Conrad Hilton hotel, Chicago, September 15-17. For this reason the chairmen of the technical committees had been invited to attend the meeting.

An important item on the agenda of the meeting was a discussion of the plans that are being made for the annual convention. In line with customary practice, the business sessions of the meeting will be devoted largely to the presentation and consideration of the eight technical committee reports, although a number of additional features of interest are under consideration. As for a number of years, the annual meeting will be held concurrently with that of the Roadmasters and Maintenance of Way Association, and two joint sessions of the groups are being planned.

Supply Trade News

Personal

Frank Mussell, Eastern territory manager of the Tractor division of the **Allis-Chalmers Manufacturing Company,** Milwaukee Wis., has been named vice-president and general sales manager of the Tractor division, succeeding **Willis G. Scholl,** who has been named vice-president in charge of the Tractor division. Mr. Scholl succeeds **R. S. Stevenson** who has been elected executive vice-president of Allis-Chalmers.

Mr. Stevenson has been associated with the Allis-Chalmers Tractor division since 1933 when he joined the Kansas City branch as a salesman. Two years later he was promoted to assistant manager of the company's branch at Omaha, Neb., and in 1936 was named assistant Southwest territory manager. Later the same year he was named manager of the division's Northwest territory. In 1941, Mr. Stevenson was appointed Southwest territory manager, which position he held until he was named assistant general sales manager in 1948. In 1950 he was appointed general sales manager of the Tractor division and in 1951 was appointed to the position of vice-president in charge of the Tractor division.

Mr. Scholl joined Allis-Chalmers in 1936 as a salesman for the Tractor division's branch at Columbus, Ohio, and in 1941 was named assistant branch manager of the Toledo (Ohio) branch house. After serving as branch manager at Toledo from 1943 to 1947, he was promoted to manager of the Eastern territory, a position he held until his appointment to general sales manager of the Tractor division early in 1951. He was named vice-president and general sales manager of the division in September 1951.

Mr. Mussell entered the service of the company in 1936 as a blockman in the firm's Des Moines (Iowa) branch of the Tractor division. In 1937 he became

(*Continued on page* 795)

R. S. Stevenson

Willis G. Scholl

Frank Mussell

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GRINDER

For Heavy Duty Grinding At Lower Cost

Positive control maintains accurate relationship between grinding wheel and rail. The results are SMOOTH, ACCURATELY ground welds that stand up longer under traffic and reduce track maintenance costs.

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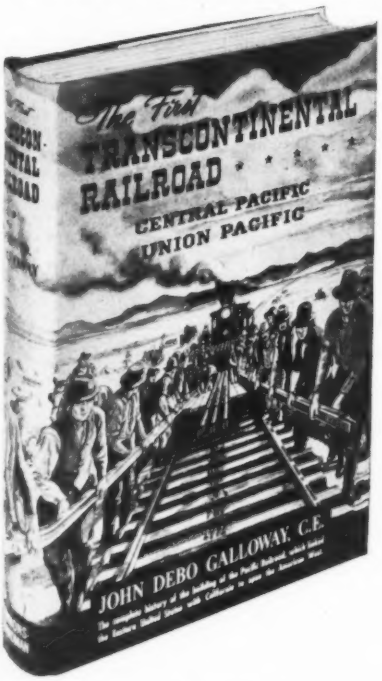

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R. E. & M. 8-52

agricultural sales manager of the Des Moines branch and in 1941 was named manager of the Mason City (Iowa) branch. Mr. Mussell was appointed Eastern territory manager in 1942. He also served recently as director of the National Production Authority's agricultural machinery and implements division at Washington, D. C.

S. S. Bruce, Jr., has been appointed zone manager in the Eastern region of the **Air Reduction Sales Company** with headquarters at Philadelphia, Pa., and **J. S. Stevens** has been named zone manager at Waycross, Ga.

S. C. Williams has been named general field sales manager and **Walter W. Kemphert** has been appointed Mid-West district manager of the **Pyrene Manufacturing Company,** Newark, N. J.

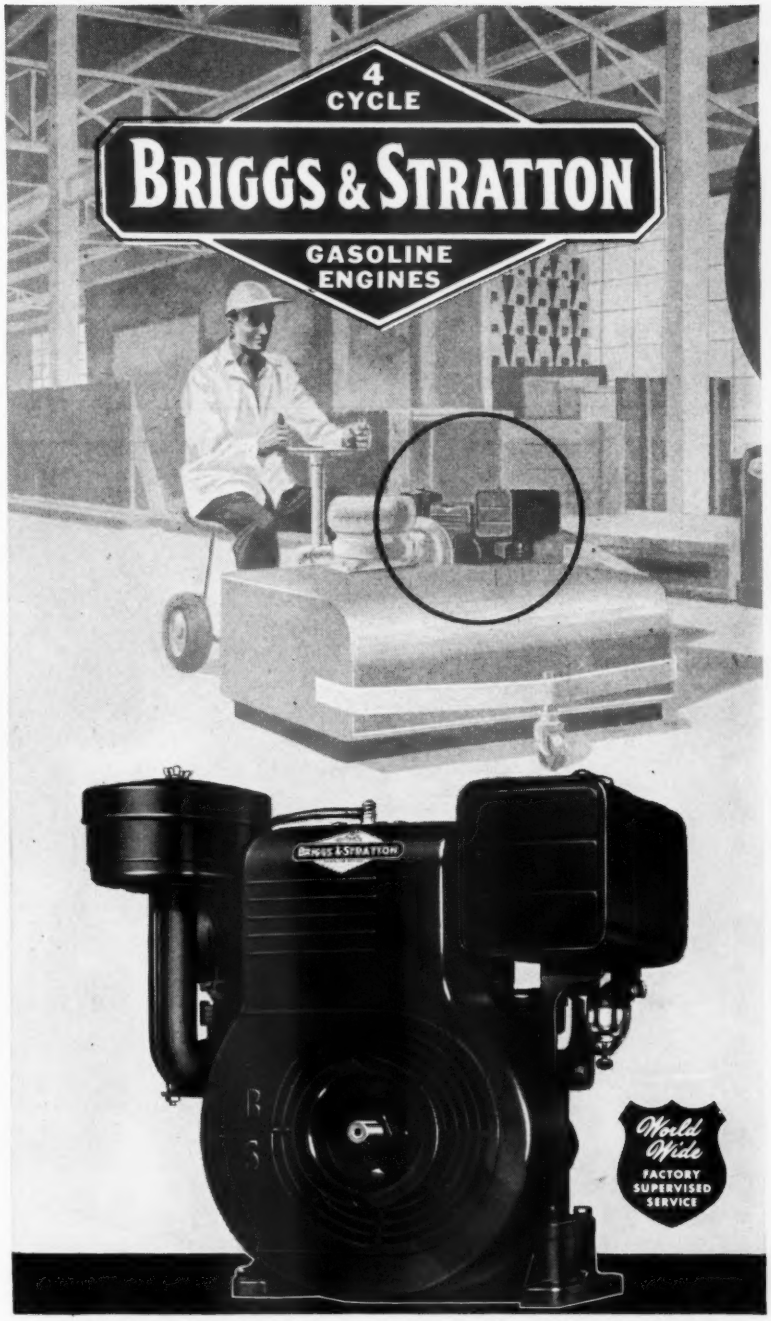
Joseph H. Young, 88, who recently retired as assistant to the president of the Westinghouse Air Brake and the Union Switch & Signal Companies, has been named assistant to the chairman of **Poor & Co.,** Chicago.

Mr. Young was born in Salt Lake City, Utah, in 1864, and left the University of Utah in 1880 to join the Union Pacific as a rodman. In 1881, he became associated with the Utah Central in various capacities; and from 1882 to 1886 served the Union Pacific at Ogden, later becoming traveling passenger agent for the Chicago & North Western. From 1886 until 1910, he served with the Salt Lake Eastern, the Union Pacific, the Rio Grande Western, the Colorado & South-

Joseph H. Young

ern, the St. Louis-San Francisco, and the Southern Pacific. In the latter year, he became president of the Alaska Steamship Company, the Northwestern Steamship Company, the North Coast Lighterage Company, and vice-president of the Copper Diver & Northwestern—allied subsidiaries of the Alaska Syndicate. In 1912 Mr. Young became president of the Spokane, Portland & Seattle and its subsidiaries, the Oregon Trunk, the Pacific & Eastern, the Spokane & Inland Empire, the Oregon Electric, the United Railways and the Dalles, Portland & Astoria Navigation Co. In 1914, he became president

(*Continued on page* 796)



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Supply Trade News (Cont'd)

of the Norfolk Southern, retaining this position until appointed federal manager of the Virginian, the N S, the Carolina and the Kingston Carolina during World War I. On January 15, 1919, he became senior assistant director of the United States Railroad Administration. When government control of the railroads terminated, he returned to the N S, in his former position as president, and in 1921 accepted the presidency of the Denver & Rio Grande. He became receiver of the road the following year and shortly thereafter resigned to become president of the Rio Grande Southern. In 1927, Mr. Young was named assistant to the president, Westinghouse Air Brake and Union Switch & Signal, where he served 25 years, retiring December 13, 1951.

Phillip H. McManus, general sales manager of **Templeton, Kenly & Co.,** Chicago, has been appointed vice-president in charge of sales. In addition to directing sales, he will travel in the Far Western territory. **William H. Zepp,** a new addition to the sales staff, will assist Mr. McManus in the states of Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, and Wisconsin. **William D. Boldt,** Southeastern division sales manager at Atlanta, Ga., has been assigned the states of Arkansas and Louisiana in addition to his former territory of Alabama, Georgia, Florida, Mississippi, Tennessee, North Carolina, and South Carolina. **Arthur C. Templeton,** from his headquarters at Dallas, Tex., will cover the states of Oklahoma and Texas.

Paul Hansen has been appointed manager of railroad sales, Central division, **Armco Drainage & Metal Products, Inc.** For the past six years Mr. Hansen has been manager of the company's construction department. Previously, he had served with the Pennsylvania as a civil

Paul Hansen

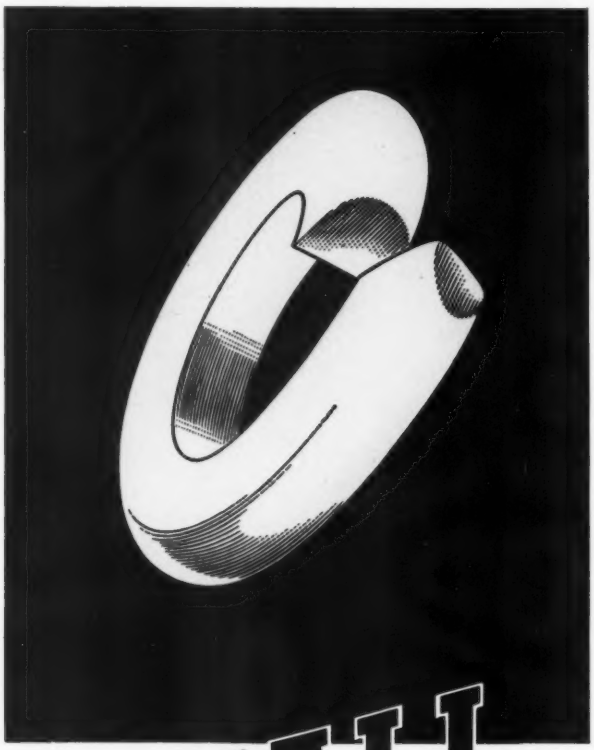
engineer. Mr. Hansen, whose headquarters will be at the company's office in the Keith building, Cleveland, Ohio, succeeds **C. H. Anderson,** who has resigned to enter business with his father at Mahaffey, Pa.

Obituary

F. E. Schaumberg, railroad representative in the sales development division of the **Caterpillar Tractor Company,** died in his home at Peoria, Ill., on June 26. Mr. Schaumberg had been associated with the Northern Pacific, the Chicago Great Western and the Chicago & North

F. E. Schaumberg

Western before joining the sales organization of Caterpillar in 1944. He was a past president of the Maintenance of Way Club of Chicago and a member of the Roadmasters and Maintenance of Way Association of America.



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Trade Publications

To obtain copies of any of the publications mentioned in these columns, use postcards, page 739.

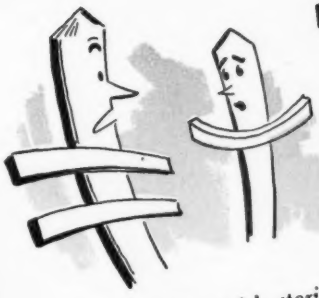
Check Valves—A new, two-page bulletin, designated as bulletin WS-1, has recently been issued by the Golden-Anderson Valve Specialty Company, Pittsburgh, Pa., describing Golden Anderson's hydraulic double cushioned check valves. Two detailed drawings show the complete list of all component parts of the valves, and applications, construction details, sizes and pressures are fully described, along with tables showing general dimensions and figure numbers.

Tractor Tools—A new 16-page booklet, entitled "A Story of Tractor Tools and Their Uses," has been published by the Hyster Company, Portland, Ore. Printed in four colors, the booklet employs a cartoon style which presents uses for Hyster equipment on various jobs in different industries when employed in conjunction with Caterpillar tractors. Winches, cranes, shovels, draglines, arches, and other tools are illustrated in operation on farms, railroads, highways, and elsewhere.

Drainage Pipe—Armco Drainage & Metal Products, Inc., Middletown, Ohio, has recently announced the publication of a new 24-page manual concerning Armco large diameter Multi-Plate pipe. The booklet, designated as Manual MP-1652, explains the engineering and design features of Multi-Plate, tells where and how to use it, and illustrates a wide variety of installations. In addition, there is presented a section on technical data complete with charts, tables and graphs, and a handy check list of the company's other products.

Tie Inserter-Puller—Design and operation features of the Nordberg Gandy, a multi-purpose machine for out-of-face tie renewal and raising operations, are contained in a new two-color bulletin published by the Nordberg Manufacturing Company, Milwaukee, Wis. Bulletin 201 illustrates by on-the-job photographs how the Gandy may be adapted to pull out old ties, insert new ties, pile or load ties, set track machines on or off track and haul and distribute new ties. Also shown are pertinent specifications and details of the propulsion mechanism and the lever-setoff roller-clamp device.

Steel Buildings—United States Steel Fabricators, Inc., Wooster, Ohio, have recently issued an eight-page booklet which describes the industrial, farm and commercial uses of USF all-steel utility buildings. Over three pages of illustrations show the various styles and applications of the prefabricated structures, and the methods of erection. Descriptive matter includes a section on design features, full specifications, complete details of the USF clip-and-wedge fastening assembly, and drawings of six standard wall panels, together with information on how to plan your own building. One full page is devoted to the USF "Handy Hut," a small portable or permanent steel utility building.



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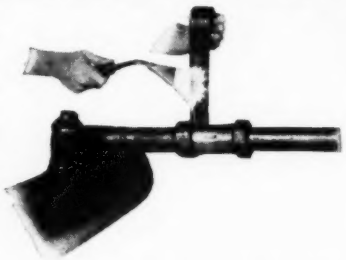

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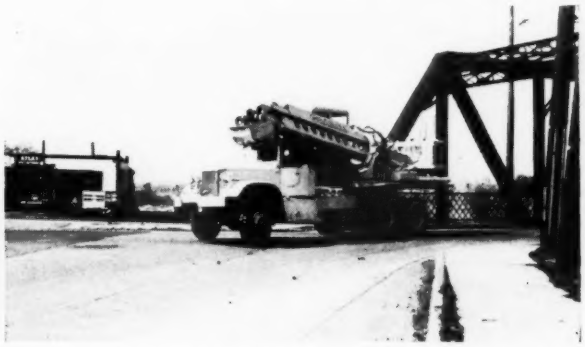

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Gradall, with its powerful hydraulic *arm-action* and *controlled down pressure,* brings new versatility and precision to off-track maintenance. It multiplies savings by doing the work of several one-purpose machines—by eliminating costly hand labor—by speeding up in-transit time.

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